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# ***JPRS Report***

# **Soviet Union**

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***Economic Affairs***

# Soviet Union Economic Affairs

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## ECONOMIC POLICY, ORGANIZATION, MANAGEMENT

**1988 Plan Tasks Reviewed in Gosplan Journal**  
182000064 Moscow *PLANOVYE KHOZYAYSTVO* in  
Russian No 12, Dec 87 pp 3-11

[Article by V. Kirichenko, professor; doctor of economic sciences; and Yu. Uvarov, candidate of economic sciences: "The Plan for '88"]

[Text] The regularly scheduled session of the USSR Supreme Soviet, which took place on the eve of the seventieth anniversary of the Great October Socialist Revolution, adopted the state plan for the economic and social development of the USSR and the USSR State Budget for 1988 — the third year of the five-year plan.

The experience of socialist construction in our country convincingly confirms the fact that all major attainments on this road are integrally connected to the most important accomplishment and advantage of the socialist economic system: the planned management of the economy as a single national economic complex. At the same time, as noted at the June (1987) Plenum of the CPSU Central Committee, under present conditions there is need for the radical restructuring of centralized economic management, and especially of planning, in the interest of bringing them into line with Soviet society's need for development as well as with the policy of expanding the independence of enterprises (associations) in every way and of raising their responsibility for their economic performance.

The plan for 1988, the first plan formulated on the basis of the guidelines for the radical restructuring of economic management, is an important step on the road to their practical implementation. It is specifically this consideration that determines its basic features and the ways articulated in the plan for realizing tasks relating to the further development of the national economy.

In the process of examining the annual plan, it is necessary to answer the main question: to what degree does it correspond to the 27th CPSU Congress's course of acceleration of the nation's social and economic development which has found tangible expression in the five-year plan's figures and indicators. The evaluation of the plan from this standpoint makes it possible to draw the following basic conclusions. First, the dynamics of the general economic indicators for 1988 accord in general with the targets of the five-year plan. Retail trade growth rates are an exception (the principal reason is that cutbacks in the production and sale of alcoholic beverages, which were widely supported by the population, have not been entirely offset by the additional production of consumer goods). But the decline in the volume of retail trade compared with the five-year plan [target] has been compensated by the additional increase in paid consumer services.

Second, the trend manifested in the first years of the five-year plan toward accelerated socioeconomic development is further strengthened in the annual plan. Third, the national economy must reach a qualitatively new level of acceleration in 1988. Unlike the first two years of the five-year plan, the growth rates of general economic indicators in the coming year either correspond to or even surpass their average annual values in the plan for 1986-1990.

Indicators and proportions of the plan for 1988 were based on five-year plan targets. But the results for the first 2 years of the five-year plan and the general economic situation in the nation were also taken into account. As noted at the USSR Supreme Soviet session, the national economy is developing dynamically in accordance with the key indicators of the five-year plan. The economic potential has been augmented and the basis has been created for further stable economic growth.

At the same time, in some branches, particularly in machine building, in the wood chemistry complex, and light industry it has not as yet been possible to secure the stable growth of production and to see to it that enterprises strictly observe their contractual delivery obligations. A number of branches are not sufficiently resolute in implementing resource conservation policies. The burden of financial problems carried over from the past continues to make itself known. In some branches, production costs are being brought down at a slow pace, there are shortages of own working capital, and many enterprises continue to operate at a loss. The development of the national economy is also affected by adverse conditions in the world market in respect to a number of items in our country's foreign trade activity.

Only through the further intensification of production can the impact of negative factors be surmounted and problems pertaining to future socioeconomic progress be solved.

The plan for 1988 envisages a substantial step in transforming intensive factors into the main, and essentially, the only source of economic growth. The entire increase in produced national income and in output volume in industry, in agriculture, in rail transport, and in construction must be secured primarily as a result of the higher productivity of social labor. This will make it possible to direct the bulk of the increase in labor resources into the nonproductive sphere for the purpose of improving consumer and cultural services. The plan's projected growth rates of labor productivity in branches of material production are reinforced by corresponding measures to raise its technical level. The implementation of measures by enterprises and associations to improve the organization of production in accordance with the decisions of the 27th CPSU Congress and the decree on

raising wages in branches of material production will be highly important for the successful fulfillment and overfulfillment of plan indicators of labor productivity growth.

A most important feature of 1988 is the dramatic increase in the role of resource conservation in the satisfaction of the national economy's growing needs for material resources and for essentially making conservation a decisive source for securing the future growth of production.

As is known, the 27th CPSU Congress advanced the task of satisfying 75-80 percent of the increase in the need for fuel, power, raw materials, and supplies on the basis of their conservation before the year 2000. This target will already be met for many types of resources in 1988. Thus, it is projected that 79 percent of the increase in production in machine building will be based on the conservation of rolled ferrous metals. Conservation in capital construction must satisfy 100 percent of the branch's additional requirement for rolled ferrous metals, lumber, and construction materials. The implementation of the indicated measures will make it possible to reduce the metal-intensiveness of the national income by 6.9 percent and to cut its energy-intensiveness by 5.3 percent in 3 years of the five-year plan (1986-1988; 1988 — projected).

Resource conservation indicators in the calculations of the plan and additional obligations adopted by the ministries to increase production are the basis of the material balance of production and construction targets. But they are very intensive and their actual attainment will require daily persistent effort on the part of all economic organs, enterprises, and organizations.

Finally, one more word about another group of intensive growth factors. They are connected with raising the return on the existing production potential and on capital investments in its technical retooling and growth. Recent measures to convert to two- and three-shift operation, to improve the utilization of existing fixed capital in so doing, and to economize productive capital investments are beginning to pay off. Next year industry in general must improve the dynamics of the output-capital ratio; machine building has already raised it. The effectiveness of productive capital investments will be slightly higher compared with the current year and five-year projections.

A vast complex of measures relating to the technical reconstruction of the national economy and to strengthening its material base — the foundation of future dynamic development and of the attainment of a new quality of economic growth — is slated for 1988. First of all, as much as 47.5 percent of the total investment in the construction of production facilities [proizvodstvennoye stroitelstvo] will be used for the technical retooling and reconstruction of existing enterprises; a large part of this investment will be the associations' and enterprises' own

funds. This year's production development fund will total 69.8 billion rubles. Work collectives will thus have a real opportunity to resolve problems in the technical retooling of production themselves.

Since machine building is the basis of technical progress in all branches of the national economy, the 1988 plan includes large-scale measures for its development. The growth rates of machine building's output must be 7.1 percent which is 1.6-fold higher than throughout industry in general. The electronics industry, electrical equipment industry, instrument making, and machine tool building will be developed on a priority basis within the framework of the complex.

It is fundamentally important that the increase in machine building output be accompanied by qualitative change. The production of progressive, science-intensive products next year will increase 1.1-1.5-fold and in the case of some products 2-fold or more. Thus the production of rotary conveyor lines will increase 2.1-fold for the year; personal computers — 2.4-fold. A large part of the progressive equipment that is built will be used to strengthen the material base of machine building itself. This will make it possible to expand substantially (almost 3-fold compared with 1985) the replacement of the active part of productive fixed capital and to get rid of a considerable quantity of worn-out and obsolete equipment.

Considering the new conditions of management and the higher demands that are made by enterprises and organizations on the quality of the equipment they acquire, the rapid restructuring of production with an eye to the changing demands of the customers and accelerated product modernization are key tasks for machine builders today. In the machine building complex, its level must increase to 9.2 percent of total output in 1988.

The party's policy of intensifying the social orientation of social production will continue in 1988. By way of fulfilling the decisions of 27th CPSU Congress on the implementation of a strong social policy and on the reorientation of economic growth from intermediate to final, socially significant results, resources have been basically redirected in favor of the solution of problems directly associated with the people's living standard and living conditions. Suffice it to say that expenditures on housing construction, on consumer goods production, on the development of trade and the service sphere, and on other needs of the population from all sources will total R402 billion, i.e., their increase will be 1.4 times higher than the planned growth of national income used for consumption and accumulation.

A characteristic feature of the social section of the plan is the considerable increase in the role of enterprises' own funds and bank loans for these purposes. One-third of all expenditures will be refinanced by them.

In the plan for 1988, there has been a major redistribution of capital investments in favor of the nonproductive sphere. They have been increased by R8.4 billion or by 18 percent compared with the five-year plan. This redistribution has for the most part been at the expense of a corresponding reduction in capital investments in the construction of production facilities and presupposes the significantly more effective use of the existing production potential. It has entailed serious changes in the branch and technological structure of capital investments and construction-installation work. Thus, the share of the nonproductive sphere in the latter will rise by 46 percent. This share has never before been so high in the nation. This naturally aggravated problems associated with the material-technical supply of housing construction and other projects in the sociocultural sphere and has required the adoption of special decisions aimed at increasing the production of construction and in particular finishing materials, sanitary engineering, and other equipment.

The indicated volume of capital investments from all sources of financing has made it possible to plan the commissioning of housing, preschool institutions, schools, health care facilities, and other facilities in the sociocultural sphere in amounts that significantly exceed five-year plan targets. As a result, counting the plan for 1988, 24 million square meters of dwelling houses more than indicated in the five-year plan will be commissioned during 3 years of the five-year plan.

The increase in the commissioning of facilities in the sociocultural sphere has meant a substantial change in the structure of the accumulation fund in national income. The share of increase of fixed capital of the nonproductive sphere in the accumulation fund in 1988 will rise to 34.8 percent compared with 29.5 percent according to the five-year plan.

In 1988 the population's money incomes will grow in accordance with the five-year plan or even slightly more. Thus the average monthly wage of workers and employees will rise to 206.8 rubles or by 0.4 percent more than the five-year plan projection; the average pay of the collective farmer will rise to 172.4 rubles or by 2.9 percent more. The allocation for centralized state measures to raise the people's living standard will be R4.1 billion — also more than the five-year plan projections.

As the June (1987) Plenum of the CPSU Central Committee emphasized, under these conditions, the problem of supplying goods and services to match the population's effective demand became a top-priority problem in the formulation of the plan for 1988. Progressive changes in the structure of consumer demand associated with the reduced sale of alcoholic beverages demanded the substantial upward revision of five-year plan projections of consumer goods production and the volume of paid consumer services. Thus, the [1988 target for the] production of food products is 3.4 percent, nonfood products (excluding light industry) — 6.5 percent, and

for paid consumer services — 5.3 percent higher than the five-year plan targets. Proceeding from the present state of the material-technical and raw materials base in light industry, the volume of production in this branch is slated to grow at the level of the five-year plan: by 4.9 percent over 1987.

The indicated increase in the production of consumer goods has seriously altered such an important national economic proportion as the correlation between Group 'A' and Group 'B' in industry. The growth rates of production in Group 'B' in 1988 will be 1.4-fold higher than in Group 'A.' As a result, the share of Group 'B' in total industrial output will rise.

Thus, the scale of the social program for 1988 considerably exceeds the five-year plan targets and its fulfillment will make it possible to take one more appreciable step toward raising the people's well-being to a qualitatively new level as envisaged by the 27th CPSU Congress.

The plan for 1988 calls for large-scale measures for modernizing and increasing the production potential, for creating conditions for the further acceleration of the country's socioeconomic potential. The overall volume of capital investments in the national economy from all sources of financing will be R202 billion.

The capital construction plan for the coming year took into account the new management principles, the expanded initiative and independence of associations and enterprises in resolving questions pertaining to production and social development. Suffice it to say that capital investments from associations' and enterprises' own funds will total R55.5 billion, that is, they will increase tenfold compared with 1986. Their share in the total volume of capital investments in the state sector will reach 31 percent. In some branches, 50 or more percent of the total growth of production capacities will be financed by enterprise funds.

The timely activation of production capacities and facilities in the sociocultural sphere will continue to be the principal task of capital construction in the coming year. Unfortunately, progress in this area is extremely slow and this problem remains acute.

The policy of planning and implementing capital investments in strict accordance with normative construction time will be continued in 1988. Banks in the USSR are forbidden to accept for financing construction projects included in the plan with violations of construction duration norms. An important new feature is that this demand extends not only to construction projects financed by centralized state capital investments but also to projects financed by enterprises and organizations.

And finally, fundamentally new for construction was the introduction of state acceptance as of 1 January 1988 at 72 construction industry enterprises as well as dwelling

houses and social projects in 20 republic, kray, and oblast centers. Thus the question of dramatically improving the quality of construction is practically resolved.

The coming year will be an important stage in the realization of the main tasks in the restructuring of management of the national economy and the practical implementation of the Guidelines for the Radical Restructuring of Economic Management and the Law on the State Enterprise (Association). The sphere of application of principles of full cost accounting and self-financing will be significantly expanded. A number of ministries are making the transition from experiments at individual enterprises, from testing the indicated principles to the large-scale introduction of new management techniques. Suffice it to say that starting on 1 January 1988, enterprises and associations producing 60 percent of all industrial output will begin operating on full cost-accounting and self-financing principles. These principles will also be widely developed in other branches of the national economy — in the agroindustrial complex, in transport, in communications, in construction, in trade, and in consumer services.

The 1988 plan and budget adopted by the session create important prerequisites for developing the initiative and independence of work collectives will simultaneously raise the level of centralized planned management. This is secured by a number of specific measures, among which special mention should be made of the following.

First, the five-year plan has in fact been transformed into the basic form of planning of the nation's socioeconomic development. Unlike the preceding period, when one-year plans were formulated in isolation from five-year plan targets, the five-year plan is now the basis for formulating one-year plans. This policy was maintained in the formulation of the plan for 1987 and was reinforced in the drafting of the 1988 plan. The absolute majority of plan indicators for 1988 was established in strict accordance with the five-year plan, but their growth rates were calculated for the planning base of 1987.

Such a procedure means abandoning the basis, the status quo in planning and promotes the stability of five-year plan targets. It places the leading branches and work collectives that are fulfilling plan targets successfully in the best conditions. Now they do not have to fear that the overfulfillment of plans in the current year will automatically result in more intensive plans in the future. Consequently, enterprises are not interested in concealing their reserves. To the contrary, it is advantageous for them to bring their reserves into play, to overfulfill the plan, and to realize additional cost-accounting income.

At the same time, higher demands are made on branches and enterprises that fail to fulfill the plan. The new principle that is being put into effect is: if you failed to

meet the plan in the current year, work more intensively in the coming year, make up for lost time, meet the five-year plan targets. This is specifically the position that will confront many machine building enterprises in 1988 if they underfulfilled their plan for the current year.

Second, in accordance with the demands of the Law on the State Enterprise (Association), the composition of plan indicators and the procedure for formulating them will be reexamined. The state order will become the central link. It encompasses the commissioning of production capacities and facilities in the social sphere financed by centralized state capital investments; deliveries and purchases of agricultural products; and the delivery and production of the most important types of industrial products. The volume included in the state order is the minimum necessary to observe basic national economic proportions, to accelerate scientific-technological progress, to raise the people's well-being; and to strengthen the nation's defensive capability and increase its economic independence.

The following data can be cited as a quantitative characterization of the state order. The total number of items in the state order will be less than one-third the number of mandatory indicators approved and conveyed to ministries and enterprises in the plan for the current year. The state nomenclature order is formulated on the basis of branch features and embraces various shares of products produced by a branch. But on the whole a considerable part of the planned volume of production will be formulated by the associations and enterprises themselves on the basis of direct economic ties with customers.

It should be noted that a number of ministries tried to expand the nomenclature of the state order for 1988, which essentially means a return to the old practice when the entire nomenclature of output was established for enterprises from above. The inertia of thinking and the lack of understanding of the very essence of the new system make themselves felt. Some managers still feel that if some indicator is not in the plan, all threads of enterprise management will be lost, and there will be a loss of faith in the efficacy of economic levers and incentives.

The formation of the state order for commissioning capacities and projects has a number of specific features. In the case of ministries and departments, associations and enterprise-customers, it includes only construction projects that are financed by centralized state capital investments; in the case of contractors, the state order includes the commissioning of production capacities and projects in the social sphere (according to a limited nomenclature) from all sources of financing. Henceforth, enterprises and association-customers can be certain that all projects included in the plan are equally important to contractor organizations, including those that are

financed by production and social development funds, and that they will accordingly be erected in strict accordance with the concluded contracts.

The formulation of the plan for 1988 is only the first attempt at formulating the state order and therefore its composition cannot yet be considered flawless. It will be updated so that its most rational structure will be developed at the time the 13th Five-Year Plan is ratified.

Another feature of the plan for 1988 is the change in the status of economic indicators in the plan that are envisaged in the Law on the State Enterprise and in the composition of the control figures of the five-year plan: the volume of output, work, or services in value terms (estimated) for the conclusion of contracts; labor productivity; currency proceeds; and general indicators of scientific-technological progress and the development of the social sphere. They were also contained in the plan for 1987 but now mandatory indicators have become raw data used in the independent formulation of the enterprise or association plan.

On the one hand, the economic indicators that are conveyed to ministries, departments, associations, and enterprises in the plan for 1988 are parameters that reflect social requirements for output and minimum demands on effectiveness. These are the reference points that must be reached by branches in order to realize the tasks confronting the national economy in general and to observe the most important macroeconomic proportions. On the other hand (this is fundamentally new), these are the parameters that work collectives are most directly interested in approximating as closely as possible or exceeding. Only then can they achieve real growth in the wage fund and cost-accounting income and consequently create a possibility for accelerated production and social development. Long-term economic norms conveyed to enterprises and associations simultaneously with plan projections for 1988 serve as the motivation to reach the economic indicators contained in the plan. It is especially important that economic norms established prior to the end of the five-year plan were assigned to all associations and enterprises converted to full cost accounting and self-financing starting in 1988 and it is now necessary to preserve their stability in 1989-1990.

Speaking of economic norms, we cannot fail to note their imperfections in a number of cases since norms are based on indicators of the approved five-year plan, interrelations of the enterprises with the budget that form in the plan, and the projected volume of capital investments, including investments in the technical retooling and reconstruction of existing enterprises. And they all have the important advantage of being stable up to the end of the five-year plan.

Stability of norms permits associations and enterprises to organize their work on the formulation of plans for 1989-1990 along new lines. They will now be able to analyze available internal reserves for increasing the

volume and effectiveness of production in the last years of the five-year plan, to incorporate them in the plans, to study problems of material-technical supply of projected development together with higher agencies, etc.

An important step in the development of new forms of material-technical supply will be made in 1988. Above all, they include the further expansion of the sphere of retail trade in the means of production.

The second substantial change in the organization of the material-technical supply of the national economy is the intensification of direct economic relations between producers and customers on a fundamentally new basis. The reference is first of all to the part of the product that is not included in the state order, the nomenclature, and the volume of production and that the enterprise now determines independently.

This is new and therefore the work must be precisely organized. If it is not organized on schedule, it may happen that the previous economic ties will be severed before the new ones have formed. As a result, at the beginning of the coming year there will be the risk of interruptions in material-technical supply with all the attendant negative consequences for production. It is not by chance that the significance of this question was specially emphasized at a conference held at the USSR Council of Ministers in October 1987, which obligated all ministries and departments to take exhaustive measures to complete in the shortest possible time work on the conclusion of economic contracts by enterprises and organizations required for ensuring stable production activity in the coming year.

Such are the basic tasks and features of the plan for 1988. The plan embodies the party's demands for making the decisive transition to the intensive path of development, to the attainment of economic growth of a new quality, and to the cardinal restructuring of the management of the national economy. The practicability of fulfilling intensive plan targets depends on the everyday energetic and purposeful work of all associations, enterprises, organizations, and organs of management; the development of creative initiative and the increased interest of the work force in high performance; the in depth assimilation of the essence of the cardinal reform of management by every worker; and the skillful use of the potential opened up by the new methods of management.

In the coming year, planning and economic management organs will have to do a great deal of work to intensify the restructuring of the management of the national economy. Above all, this will take the form of organizational and structural changes in accordance with the decisions of the June (1987) Plenum of the CPSU Central Committee and decrees on the restructuring of the activity of central economic departments and organs of branch management. Changes include the formation

of economic planning administrations of kray and oblast ispolkoms of workers' deputies and such new organizational structures as state production associations.

Economic work, especially in the course of preparing the financial rehabilitation program envisaged in the decisions of the June Plenum of the Central Committee, the revision of wholesale and purchase prices, and the conversion of the formation of republic and local budgets to a new basis — according to long-term economic norms, must be raised to a new level. All this requires the study of deep theoretical and methodological problems and practical solutions for the most important and very acute problems of in modern economics.

A step toward the realization of new approaches to long-range planning must be made in the area of national economic planning. The reference is to the creation of the Comprehensive Plan for Economic and Social Development of the USSR for the Next '5-Year Period (up to the Year 2000) — a document of great economic and political significance — in the new few months of 1988.

The Comprehensive Plan must be an analytical scientific document that presents the general design in concentrated form and that basically enunciates a system of measures relating to the scientific-technical structure and organizational-economic restructuring of the Soviet economy with the aim of raising it to the highest level in the world with regard to effectiveness and level of organization. It reveals the goals of economic and social development and the basic avenues to their attainment. It defines the range of key scientific-technical, economic, social, and foreign economic problems to be studied in depth in subsequent stages of formulation of the plans. It establishes priorities. It substantiates the system of raw data that describe the possible volume of resources for development, national economic demands on the effectiveness of their use throughout the national economy as a whole, in complexes of branches, and at the territorial level.

Under present conditions, the great significance of the conceptual stage of long-range planning is emphasized by a number of new circumstances and conditions. It is above all emphasized by the fact that long-term tasks posed by the 27th CPSU Congress in the area of economic construction and social development are characterized by their unprecedented scale and novelty. The point at issue is the substantiation of specific ways of attaining the highest level of labor productivity in the world, the in depth restructuring of social production, the use of resource conservation as a decisive source for meeting the national economy's additional needs, and of bringing the people's well-being to a qualitatively new level. It is specifically in such an initial stage of formulation of long-range plans that we can use scientific data with maximum benefit and engage the leading specialists and scientists in the formulation of the documentation and substantiations required in this stage. Finally, we

must now for the first time elaborate long-range directions of economic development under the conditions of the radical restructuring of the economic mechanism on the way to expanding the economic independence of the primary production link, territorial management organs, and the transition to economic methods of management. It is specifically when the conception is formulated under these conditions that it becomes necessary and possible to form a truly national economic approach to the resolution of myriad problems of socioeconomic development and to select goals and reference points for further planning work at all levels of economic management that ensures the unity of the basic design and plans in accordance with the needs of all society.

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## INVESTMENT, PRICES, BUDGET, FINANCE

### Bunich Defines Essence, Problems of Self-Financing

18200009 Moscow *SOTSIALISTICHESKIY TRUD* in Russian No 7, Jul 87 pp 7-17 No 9, Sep 87 pp 10-19

[Article by P. Bunich, Corresponding Member of USSR Academy of Sciences: "Self-Financing of Principal Economic Element: Prerequisites, Essence, Problems and Trends.]

[No 7, Jul 87 pp 7-17] Part I (1). Self-financing and Distribution of Cost of Products Produced.

[Text] The requirement for self-financing did not arise yesterday in our country. It appeared in connection with the conversion of state enterprises over to cost accounting following the victory of the Great October Socialist Revolution and it functioned up until the onset of the stage of militant communism and also following its completion prior to the country's industrialization. During the conversion over to industrialization, with a sharp increase taking place in the scales of state support for low profitability (at the time) enterprises of heavy industry, a requirement existed for accelerating the creation of new branches, establishing new territories and centralizing resources, factors which did not fall within the framework for the self-financing of individual enterprises, but on the state scale and taking into account future prospects provided a solution for vitally important problems, including high profitability.

During this modern stage, the economic conditions have changed substantially and the prerequisites have formed for the new stage — for converting collectives over to self-financing.

First of all, the enterprises have become as a rule adequately equipped from a technical standpoint and sufficiently stable and profitable from a financial standpoint.

Secondly, the chief path for economic development has shifted over to intensification, to the development of existing production operations and their modernization, technical re-equipping and expansion and to accelerating scientific-technical progress based upon the production potential created. Moreover, the country possesses adequate resources for successfully combining self-financing with solutions for those tasks which require irrevocable budgetary financing.

Thirdly, a need has arisen for holding collectives completely responsible for their actions. This will make it possible to raise the effectiveness of production and to satisfy the requirement of a majority of workers to control their own economy and also their desire for independence. Such an approach requires complete cost accounting, which supports self-financing in the capacity of an inalienable and most important feature.

Fourthly, the scales of the economy have grown such that all-encompassing centralized planning and its associated centralized financing have turned out to be inefficient and even impossible. As is known, the number of associations increases in a quadratic dependence upon the increase in the number of objects administered. The number of work collectives in the country is approaching one million. But indeed the problem is not simply one of "numbers." The objects themselves are developing in a more dynamic manner. Rapid changes are taking place in them and many problems are best solved by more efficient maneuvering of "available" resources and forces.

Fifthly, the party has developed the concept of accelerating socio-economic development, which defines the place of self-financing in a planned economy. Economic experiments furnished the initial practical material for this concept and they confirmed the correctness of the principles formulated.

Sixthly, highly skilled administrative workers as a rule are performing tasks at enterprises and in regions, branches and central administrative organs and they are capable of learning how to make and implement intelligent decisions concerned with self-financing that will benefit both society and the collectives. In addition, they are able to work in the absence of petty support from above.

The development of self-financing relationships in a socialist economy in no way assumes or tolerates a retreat from the principles concerned with strengthening socialist ownership of the means of production and its results. Of itself, self-financing does not constrict the required sphere of centralization. But within the framework of such a tremendous, complicated and dynamic economy such as ours, it differs qualitatively from the

comparatively simple forms for combining self-financing with planning on a national scale in the past. It is important for this fact to be taken into consideration.

Importance is also attached to distinguishing between self-financing and self-support. Quite often these concepts are ranked together as being the same. However, it is believed that the category of self-support has an independent meaning. The concept of self-support assumes that the expenditures of enterprises must necessarily be repaid. If, for example, the norm for effectiveness of capital investments is 15 percent profit annually, then these investments must be repaid within not more than 6.6 years and if 12 percent — within 8.3 years.

The development of self-support on the basis of profit assumes the involvement of socially justified amortization amounts and expenditures for raw materials, other materials and wages. If these values are inflated, then the resulting profit decreases and self-support is not realized within the normative periods. If on the other hand the production cost turns out to be lower than that which is socially justified, then self-support is accelerated and superprofit occurs. In the event price formation is oriented towards an expenditure approach, such processes come to an end: an increase in expenses leads to growth in profit and self-support remains adequate from a formal standpoint.

A self-support effectiveness that conforms to the norm ensures loss-free operations and this presupposes not only the reimbursement for cost but also the development of normal profit, a reduction in which and a drop in the value of surplus product are equivalent to compensating for any expended resource and point towards production inefficiency and unprofitability. From an economic standpoint, low profitability enterprises appear merely as the "good" portion of unprofitable ones and it is for good reason that they are usually examined in the overall group with clearly unprofitable enterprises.

However, self-support as the observance (or an acceleration) of the normative periods for output is not meant to imply that the profit obtained on its basis is assigned to collectives and relatively closed subsequent circulation of this income takes place in these same cost accounting cells. Self-support neither excludes the placement of self-supporting profit in the budget nor the granting to collectives of initial and new funds from the budget. When necessary, the state can increase (reduce) the resources of enterprises (including amortization) by means of an additional allocation (withdrawal) of funds from centralized sources.

Self-financing is another matter entirely. Its essence lies not only in self-support for expenditures but also in assigning the earnings obtained to enterprises. Whereas self-support ensured by profit is only latently (secretly, in the absence of external manifestations) based upon

socially needed expenditures of materialized and live labor, self-financing clearly requires the reproduction of each resource separately and also the creation of true profit and its utilization. Moreover, distinct from self-support, which is computed based up on the total amount of profit, self-financing is concerned only with cost accounting profit, that is, that which remains following payments to the budget, to banks and to the branch ministry. This implies that all of the costs of enterprises are paid for from their "own" funds and that amortization funds, working capital, wage funds and savings are earned by a collective and assigned to it. Such self-financing is in keeping with the Marxist formula which holds that "in society, based upon the principles of collectivism and public ownership of the means of production, each individual producer receives back from society, with all deductions taken into account, an amount equal to the contribution he made" (2). Thus self-support, as aspect of self-financing, is a necessary but inadequate condition. Self-financing can be viewed as the highest step in the development of cost accounting compared to self-support.

With regard to the relationship between self-financing and cost accounting, it is obvious that the concept of cost accounting is more extensive. In addition to self-financing, it includes the independence of collectives (self-planning, self-supply, enlistment of the masses in administering the economy right up to converting over to self-administration, organizational structure within enterprises); the legal prerequisites for cost accounting activity; rights of a legal entity, contractual responsibility and so forth.

The interrelationships of an enterprise with society are based upon cost accounting but they do not stop here. Enterprises participate in a gratuitous transfer of leading experience, they carry out ideological work in their region, city, republic and country, they provide patronage support for children's homes and boarding schools and they furnish them with material and financial assistance. Using their own funds, enterprises can finance the repair, equipping and construction of general educational schools and professional-technical institutes, create school and inter-school workshops, production-training combines and shops, they send specialists to serve as masters in the training of students and they turn over facilities, equipment, instruments, appliances and materials to other training institutes and children's institutions.

At the present time, the use of self-financing is quite extensive. Industrial enterprises which operate under these conditions are producing more than 20 percent of the marketable products. Their number has reached 7 percent of the industrial associations and enterprises. All state trade, consumer cooperation, the maritime fleet and the domestic services enterprises are all operating on a self-financing basis. In 1987, almost one fourth of the kolkhozes and sovkhozes will convert over to self-financing. The decision has been handed down to convert

USSR Goskominturist over to complete cost accounting, currency self-support and self-financing. In 1988, enterprises of machine building, metallurgy, chemical, pulp and paper and a number of other branches of industry will commence operating on a complete cost accounting basis. In 1988 and 1989, the principles of self-financing will be employed extensively throughout the entire national economy.

In this regard, great importance is being attached to solving those problems associated with the irreversible laws of its further development and the logic involved in expanding and strengthening the associated processes. "An organic system" wrote Karl Marx, "as an aggregate whole, has its own prerequisites and its development in the direction of integrity consists precisely of overriding all elements of society or creating from it all of the missing organs. It is in this manner that the system gains in integrity during the course of historic development" (3).

Self-financing is carried out to the finish only when it no longer leaves "cracks" through which unearned income can appear. Strictly speaking, half and half self-financing is really not self-financing, but at best merely a step in that direction. Commencing in 1987, the principles of self-financing are being implemented in a more consistent manner by enterprises of Minkhimmash [Ministry of Chemical and Petroleum Machine Building], Minpribor [Ministry of Instrument Making, Automation Equipment, and Control Systems], Minavtoprom [Ministry of the Automotive Industry] and USSR Minneftekhimprom [Ministry of the Petroleum Refining and Petrochemical Industry] and also at 36 enterprises of other industrial ministries, in steamship agencies and organizations of Minmorflot [Ministry of the Maritime Fleet] and in a number of enterprises of the Ministry of Civil Aviation and consumer cooperation. In some instances, when deemed necessary for carrying out measures concerned with the technical re-equipping of production, enterprises are authorized to use their own internal resources for carrying out the new construction of installations of a general plant and auxiliary nature.

Self-financing is already being employed at enterprises of light industry, domestic services for the population, construction, at a number of enterprises of the agro-industrial complex and in state trade. Large-scale measures aimed at expanding existing and introducing new capabilities into operations at existing enterprises are being carried out in light industry using centralized resources. The construction of large-scale installations is being financed on a centralized basis in the sphere of domestic services. Enterprises within the USSR Gosagroprom [State Agro-industrial Committee] system are receiving budgetary appropriations mainly for further development of the logistical base for increasing production and for solving social problems; their amounts have been determined by years of the 12th Five-Year Plan taking into account the increase in the proportion of internal resources. Farms in Stavropol Kray and

Vologda Oblast are operating on a self-financing basis. This principle served as the foundation for the creation of the Kuban type agricultural combines. The construction of large-scale installations of inter-branch, branch, inter-regional and regional importance is being carried out in state trade using centralized resources and the state budget. Complete self-financing operations are being employed by prospecting crews, cooperatives for the procurement and processing of secondary raw materials, by other enterprises engaged in production cooperation and by persons carrying out private work activities. The draft USSR Law Governing a State Enterprise (association) establishes the fact that self-financing is intended to cover the technical re-equipping, modernization and expansion of production. In special instances, large-scale measures for modernization and expansion are financed using centralized sources.

At the same time, new construction projects are not covered by self-financing even though they meet the normative coefficient for effectiveness and can be carried out using bank loans. In the future, the formula "the state provides new enterprises with regulated funds" must obviously be supplemented by the formula "these funds are credited."

Self-financing is limited if considerable expenditures are not included in the production costs, that is, the expenses are not fully taken into account. Such is the situation today.

The economic mechanism for self-financing assumes payment for all natural resources utilized. If this is not done, those enterprises stand to profit which "economize" in their expenditures and increase their profit at the expense of harm to the natural environment. Let us take the water supplied to agricultural enterprises for irrigation. It is now free of charge. As a result, consumption exceeds the norm by a factor of 1.3-1.5. The aquacultural systems are also not on a cost accounting basis, since even for water that is paid for, for example by industrial enterprises, the payments are made into budgetary income and not directly to the aquacultural organizations. A number of aquacultural systems, in particular, in the North Caucasus and the republics of Central Asia, have at one time or another operated on a cost accounting basis. Experience has produced positive results. In 1975, Minvodkhoz [Ministry of Land Reclamation and Water Resources] issued an order calling for this experience to be summarized. But this work has still not been completed.

For agriculture, importance is attached to carrying out an economic evaluation of the land, for forestry — timber lands and for the extractive industry — the resources of petroleum, gas, coal and other materials, so as to make it possible to levy appropriate punitive sanctions. The problem of evaluating occupied territories and the reflection of this evaluation in the payments by enterprises has become more urgent. At the present time, such an evaluation is given when determining the

compensation amounts for agricultural losses caused by the withdrawal of land areas from use. It is included in the value of the fixed capital of newly introduced enterprises and is legalized through growth in the planned amortization deductions. As a result of this, the price for land for all practical purposes does not disturb anybody (not even the collectives of new construction projects). This leads to a situation in which the territories occupied by enterprises have become excessively large.

Sanctions must also be applied for harm inflicted on the natural environment. In the absence of such sanctions, collectives which "economize" in their ecological expenditures realize an unjustified economic gain. Payments which compensate for state expenditures for geological exploratory work are incomplete and are directed into the state budget and not into the branch.

Amortization deductions must be carried out from the fixed capital of science. This is not being done. The problem is somewhat more extensive: the state expends tremendous resources for the maintenance of science and the planning, financial, statistical and other organs, for protecting the natural environment, for personnel training, for the development of public health and for other needs. But they are not being recovered in the expenditures of enterprises and they make it possible to embellish the economic results of production. Appropriate charges are needed for this type of cost in order to avoid an artificial lowering of the indicators for effectiveness. Punitive sanctions were also lowered. On the one hand, the collectives are not receiving compensation for somebody else's poor products and, on the other — they are being underpaid because of their own mistakes. Rarely is a "balance" achieved. In this regard, a positive change for the better is noted in the draft USSR Law Governing a State Enterprise (association): it is stated in this law that enterprises which violate a contract must reimburse their partners for damages sustained.

The program for self-financing presupposes the transfer of a considerable portion of the services now being furnished on a patronage basis over to a cost accounting basis. In particular, the kolkhozes and sovkhozes must transfer funds to those enterprises and organizations which sent manual and office workers into rural areas to perform temporary work, they must provide compensation for the wages paid to them at their former (principal) workplace, they must provide payment for travel and daily allowances and transfer funds over for the lease of equipment. It is believed that this derives from the draft Law Governing an Enterprise, where it is stated that an enterprise carries out the work and services not stipulated in the plan in accordance with the tasks of a higher organ and decisions handed down by the soviet of people's deputies, based upon economic agreements and with reimbursement for expenditures by the same enterprises and organizations for which they are being carried out.

In principle, self-financing commences with the maintenance by collectives of an amortization fund. Indeed, if the task involves the self-financing of expanded reproduction, then internally this includes the self-financing of simple reproduction, with the amortization fund being reinvested. The amortization funds are included completely in the funds for the production and social development of domestic services enterprises and they are assigned entirely to small enterprises of light industry in Estonia. Up until now, in all of the remaining cases, the amortization fund has never been assigned fully to enterprises, since at old enterprises characterized by a worn out production apparatus the current amortization is inadequate for forthcoming reproduction. Credit cannot be employed for compensating for this shortage, since there is no source for its recovery. The amortization amounts withdrawn from public resources and from centralized funds of the ministries remain to be returned to the collectives. Use can be made for this purpose of free amortization obtained from new enterprises, but in a manner such that the redistribution is carried out in a manner requiring payment. If this is not done, the new enterprises, once they begin to "age," may request an excessive amount of funds.

However, it should be borne in mind that even if amortization deductions were to be assigned to enterprises at the present time, this would not be a sign of true self-financing. Indeed the present managerial mechanism does not exclude the acceptance on the balances of enterprises of installations with unnecessarily high prices. An inflation of the amortization fund is legalized by prices which are based upon the expenditure approach. As a result, surplus and unjustified funds for compensating for a worn out production apparatus arise, even though the equipment acquired with these funds in turn is paid for at excessive prices. In the process, there are some who lose and some who find; the balance between the increases in cost for the initial fixed capital and their replacement may arise only accidentally.

Let us further examine the situation with regard to the financing of material expenditures. Outwardly and from a formal standpoint, expenditures for raw materials, other materials, component parts and fuel are always financed in a self-financing manner (often with the use of credit, which is not in conflict with self-financing). But when one considers that use is being made at a majority of enterprises of insufficiently progressive technologies and "liberal" norms for material expenditures, that the supplies of material values at raw material storehouses, in unfinished production and at storehouses for finished products are overstated and that the working capital on the whole is extremely great and a shortage in such capital is easily compensated for by bank credits, then the statement regarding self-financing for current material expenditures is just as doubtful as the use of amortization. Here we do not have self-financing, but rather an illusion of it that covers inefficient management, under the guise of formal cost accounting that is forgiving for over-expenditures of resources.

At all of these "self-financing" enterprises and in the brat vs. wages are defined as the total amount of the basic fund and its increase for an increase in the normative net output. The basic fund often exceeds the socially needed value. It is computed based upon low output norms, a raised number of workers and insufficient output volume, with the output as a rule being of low quality and an obsolete assortment. From the very beginning, the reproduction of such a fund truly overstates the wages earned. In principle, such a condition is identical to regulating the personal income from free budgetary resources and is not dependent upon true cost accounting results. The basic wage fund is retained provided a single condition is upheld: the planned growth in labor productivity must not be lower than the actual average annual rate for its growth during the preceding five-year plan (1981-1985). This provides weak collectives with still one more advantage: it is not only easier for them to achieve high increases in NChP, but as a rule in the past they had low rates of growth in labor productivity, which in the absence of work are reproduced under the new conditions. All of this is masked by the fact that the "expenditure" prices include the overstated wage funds. In the tire industry, for example, the wages are greater at those enterprises the products of which are the objects of fair criticism by consumers. The average wages at the Kupavna Fine Cloth Factory are not higher than those at the Zavidovskaya plant, despite the fact that the Kupavna products bring forth praise as opposed to the Zavidovskaya products for which there is no market. In 1986, the average monthly wage at the leading Karmenskiy Kolkhoz in Kochubeyevskiy Rayon in Stavropol Kray was 219 rubles and at the comparatively weak Zavetny Ilich Kolkhoz — 257 rubles.

The inflated nature and lack of objectivity in determining the wage fund levels which existed earlier — this was the chief weakness of those systems in which a savings in these funds is continued for the collectives (Shchokino method, new managerial conditions, economic mechanism of the agro-industrial complex, railroads, payments for workers attached to design and technological services). Another one of their shortcomings lies in the fact that from the beginning the collectives create surplus fixed capital at the expense of the state and subsequently, as a result of this capital, they reduce their personnel strength and raise average wages and believe that the profit realized is exclusively their own achievement.

At the same time, measures being carried out now aimed at raising wages by retaining the existing wage funds for the collectives must be viewed as a step forward compared to previous practice, since they ensure growth in productivity and a release of man-power. One positive aspect is the fact that the resources earned are used for introducing awards for prolonged meritorious service. The additional payments for work carried out in a multi-shift regime and paid out of the wage and incentive funds must be evaluated in a similar manner, since such work leads to growth in the production volume and to a reduction in specific expenses.

The establishment of a "base" is also in conflict with the tasks for subsequent growth in the production volumes with large capital investments, which during the course of a definite period of time do not produce a return but require additional wage funds. Thus, under the new managerial conditions the plans call in particular for an increase in these funds with large capital investments, even though the measure of growth is still rather subjective.

Other new approaches have also been outlined. Thus, at enterprises of USSR Minneftekhimprom [Ministry of the Petroleum Refining and Petrochemical Industry], light industry and domestic services, in trade, at a number of logistical supply organizations and others, the wage fund is formed by means of a normative distribution of the actual net output (gross income) remaining in a collective: wage fund and profit. The wage funds for small enterprises of the light industry of Estonia, Construction Trust No. 18 of Mosobslstroy and the Mosobliektromontazh Trust of Glavmosobslstroy are determined in this same manner. Since equipment is acquired and working capital formed by means of income from private work activity, such income also draws closer to the category of gross income.

In such instances and as a rule initially from net output, deductions are carried out for payments into the funds (small enterprises of light industry in Estonia are excluded, since they do not produce such payments), interest payments and deductions for the budget (when they are formed not for profit but for net output). A differentiation of the wage funds (with orientation to the base), which takes the form of appropriate normatives, is carried out through a differentiation of the payments into the funds and payments into the budget and ministry. Such orientation paralyzes the force of the new approach to a large degree. Thus, in one shepherd's brigade of the Zadarinskiy gospolemkhоз [state breeding farm] in Chimkent Oblast, the gross income amounted to 29,000 rubles and in another — 11,000 rubles. The normative payment for 100 rubles worth of sales in the first instance was 23.1 and in the second — 55.6 rubles. As a result, the annual payment per man in the first brigade (with an additional payment based upon the final result) was 3,287 rubles and in the second — 3,240 rubles.

Unified branch (sub-branch normatives are more correct from an economic standpoint. Moreover, they do not allow enterprises to overstate their wages in the expectation that a reduction in investments for production development compensates the state. Such expectations are still far from being eliminated. For example, during the 1985-1986 period, the kolkhozes decreased their withholdings for the indivisible funds by 37 percent. They still must learn how to devote thought to the future. Certain channels for the redistribution of resources from efficiently operating enterprises to those which are working poorly must be closed entirely and completely and

the rule that the state is not responsible for the obligations of enterprises must be adhered to in a very strict manner. Only then will it be possible to orient collectives towards displaying concern for the future and for overcoming parasitical tendencies.

However, for specific enterprises, with their various conditions and requirements, the formation of wage funds based upon common norms does not always produce the optimum values. The best method for uncovering the wage amounts — the optimization method — is that of maximizing the consumption fund of a collective for an extended period into the future. This is possible only with the aid of considerable investments, for which an enterprise must allocate a considerable portion of its net output. This provides a guarantee against distortions in its distribution in favor of current consumption. In order to correct especially high earnings of individual persons, in the interest of social fairness, use should obviously be made of a progressive increasing tax on individual incomes which exceed the untaxed minimum.

It has been established that wages reflect direct social relationships and incentive funds — commodity-money relationships (4). First of all, such a differentiation is not proper for socialist production. Direct social relationships are realized in the specific form of planned commodity-money relationships and not separately from them. Herein is found the monism of economic relationships of socialism. Further, the direct social relationships of our society develop as a trend and an approximation of an ideal and not as a fact of precise conformity to it in each actual action. Finally, a "raised reliability" does not protect wages against incentive funds by means of a "Chinese wall." In light industry, trade, domestic services for the population and in all instances involving the distribution of gross income, individual wage funds arise which are not divided into wages and material incentives.

The formation of the income of collectives, based upon a distribution of value, is at times opposed by a distribution according to labor. It has not been established that basic differences exist between them. One virtue of distribution according to labor is the fact that it reflects only internal labor factors. For example, it includes the carrying out of centralized tasks and it excludes the effect of market conditions. However, distribution according to value also includes deviations from the nomenclature established from above and it does so in a stronger manner, through bonuses for carrying them out, penalties for failures and so forth.

It is by no means certain that enterprises should be released from having to consider the market conditions, the effect on prices or other external factors. Market conditions under socialism are for the most part predetermined by the work of the producers and their contacts with consumers and they result from a study, the formation and satisfaction of the requirements of the economy

and population. Today, the role played by these conditions continues to increase. They cannot be taken into account fully in the absence of enterprises. For example, in light industry the dependence of production and wages upon the quality of the requirements has been raised substantially.

Today our stimulating functions of wages (including various payment "ceilings") and especially the demotivating functions are still quite weak. The pay for negligent workers differs very little from that for industrious workers. Only rarely are guilty parties required to provide reimbursement for losses. Incidents involving demotions or transfers over to lower paying positions are almost unique in nature. There are many reasons for this: a "shortage" of man-power, forces of inertia, leniency of legislation and lowered planning tasks. Those who work poorly must be paid accordingly.

In the system of self-financing, a special role is played by profit. At the same time, one cannot agree with the position that "profit is the principal source for self-financing under the new conditions" (5). Funds for reimbursement and wages constitute major portion of the self-financing sources.

The conversion of enterprises over to self-financing, with use being made of a portion of the profit, is being carried out according to two plans. The enterprises of Minpribor [Ministry of Instrument Making, Automation Equipment and Control Systems], Minavtoprom [Ministry of the Automotive Industry], USSR Minneftekhimprom [Ministry of the Petroleum Refining and Petrochemical Industry], USSR Minlegprom [Ministry of Light Industry] and Minmorflot [Ministry of the Maritime Fleet, the Belorussian, Komi and Lithuanian administrations and the Domodedovo Production Association of the USSR Ministry of Civil Aviation, 36 enterprises of other ministries and also construction, domestic services for the population and state trade are converting over to self-financing according to the following plan. The ministries determine for each enterprise: the proportion of profit to be added to the ministry's centralized funds (in USSR Minneftekhimprom, for example, these payments are made by one third of the enterprises and the remaining ones — are released from having to make them), how much profit is to be paid into the budget in the form of fund payments (many enterprises generally are not making such payments and the remaining ones are adding from 2 to 12 percent) and what proportion of the profit will take the form of payments into the budget (it is differentiated even by years). The ministries, taking into account the wear and tear of their fixed capital, differentiate among the enterprises the norms for the formation of the funds for the development of production, science and engineering.

They establish the incentive fund norms in accordance with the "base," norms which can be individualized additionally. True, the norms for withholdings for the centralized funds and reserves and also the norms for the

formation of incentive funds are established for each enterprise by years of the five-year plan. But this does not change their individual link to the base and leads only to an inter-annual redistribution of funds. The ministries themselves are deciding who should be furnished with assistance from their centralized funds.

All of these payments and receipts are being determined today based upon a review and approval by the ministry of the expenditures by each enterprise for capital investments. In this manner, they are essentially being converted into centralized working capital. If an enterprise succeeds in raising them, then it enjoys better conditions. High profitability in such a situation is also not a blessing but rather a shortcoming. More work must be carried out in behalf of such profitability and the portion of profit left at an enterprise is treated just as in the past. On the other hand, low income enterprises stand to realize a profit. Everything seems to level off and the stimuli disappear. Self-financing in accordance with the system under review, or more accurately a self-financing adjustment, can proceed by one means — differentiation of the withholdings for the budget, even if all of the remaining levers appear externally to be uniform. But use of the group of economic instruments mentioned earlier, used for "fitting" the resources to the planned expenditures, provides even greater conveniences in connection with a self-financing adjustment.

Several years ago, such a system was in operation in a number of ministries and it was referred to as a proportional distribution of profit. Its only difference from previous forms for interrelationships with the budget lay in the fact that earlier the budget received an indefinite net profit surplus, but within the framework of the new innovation an established proportion is computed for it (not lower than the planned absolute total). The system of proportional profit distribution did not bring about any serious positive changes. Certain changes were introduced into this system, which later became known as the normative method for profit distribution. The budget began to receive payments in planned amounts only when the profit plan was allocated fully or when the plan was underfulfilled to 2 percent. Underfulfillment in large amounts brought about a simultaneous reduction both in the resources of enterprises and the resources of society. The normative method for profit distribution is now being employed in all areas where a conversion has been carried out over to the new conditions for management.

Another system has been introduced into operations at Minkhimash [Ministry of Chemical and Petroleum Machine Building]. Here, two scales have been established for making payments into the budget, with the amounts being determined by the scales: depending upon profitability with regard to funds (property tax) and profitability with regard to production costs (income tax), regardless of the amount of expenditures legalized by the plan (6). If the profitability is great and expenditures low, then "surplus" profit will remain for the collective. It becomes interested in performing good

work, in the formation of reserve funds and in paying interest for loans undertaken earlier. On the other hand, if the profitability turns out to be low and the expenditures high, the shortage in profit will cover not the state (through "recognition" of these values by the plan) but rather the collective itself by means of former reserves, new credits and so forth.

Unfortunately, the use of "surplus" profit is regulated to an excessive degree. Withholdings for the reserve funds of enterprises are limited by a rather "humble" norm. This is obviously associated with the retention of incentive fund planning based upon the level achieved, which adjusts the funds to the production requirements regardless of income and, it follows, excludes the possibility of substantial fluctuations. Net profit cannot be directed towards raising wages, since the same basis exists here. Under these conditions, we have in mind not "surplus" profit but only "surplus" funds for the development of production, science and engineering. They are thinned out by the withdrawal of amortization deductions for the centralized fund of the branch. As a result of the established system, only that portion which was formed from profit can remain in the form of "surplus" funds for the development of production, science and engineering.

Additional "cracks" in the masking arise as a result of subjective differentiation of the withholdings from profit for the centralized resources of the ministry, as a result of which a unified scale is missing, despite the fact that in principle it is possible and needed by analogy with payments into the budget. Withholdings for the centralized funds and reserves of ministries are carried out in principle using this same state-tax portion of profit, although they appear to be payments from the profit of enterprises. Thus, these and other taxes are not collected from enterprises where the profitability lies within the limits for the untaxed minimum and they are computed as taxes from balance profit. It is interesting to note that commencing in 1987 funds are being issued from the reserves of higher organizations to the winners of the all-union socialist competition, for achieving growth in the funds for socio-cultural measures and housing construction.

The dominating position occupied by the first system is usually explained by its introduction based upon the five-year plan approved earlier. This argument is deserving of attention. But in Minkhimmash [Ministry of Chemical and Petroleum Machine Building], they succeeded in introducing tax scales despite the existence of a five-year plan. With sufficient persistence, steps in this direction could be undertaken by other ministries, by displaying a tendency towards overcoming the old financing regime and converting over to the new one. In the absence of such steps, it will be impossible to affect self-financing substantially. Is by no means an accident that branches which converted over to the mentioned system have still not succeeded in raising their planned tasks. And unless this is done it will be impossible to realize any quality improvements in the managerial

results. From an objective standpoint, above-plan achievements have a comparatively more narrow sphere of distribution than do planned ones. After obtaining the initial results of the experiment, it was felt that the problem of strengthening the existing practice of self-financing should once again be addressed; new branches were to be converted over to self-financing only in accordance with the second plan.

Interest is attached to the fact that in the machine building ministries that converted over to self-financing in 1987, the percentages of withholdings from profit for the budget during the 1987-1990 period will be rather similar. Thus, for enterprises of Minpribor they amount to 33 percent, Minkhimmash — 43 and Minavtoprom — 45.6 percent. This makes it possible to estimate that in the future it will be possible to develop unified tax scales for a number of branches.

A tax must be imposed upon currency profit (as a part of overall currency earnings). If it is distributed by transferring a "surplus" portion over to the budget or if it is increased upon the occasion of a shortage, then the collectives will lose interest in raising the effectiveness of their foreign economic relationships. The taxation of currency profit is possible within the framework of the total amount of profit for enterprises. But at those times, prior to distributing the currency funds, they should be reduced by the amount of the tax withdrawn, thus revealing the true currency funds.

Taxes on profits can be proportional and progressively increasing in nature. The Sumy machine building NPO [scientific production association] imeni M.V. Frunze, during the course of an experiment which it carried out in 1985 and 1986, introduced into the budget a unified progressive income tax on profitability (a payment into the funds for it had been abolished at the time). The enterprises of Minkhimmash transfer proportional taxes over to the budget, which with a profitability with regard to funds (property tax) of more than 12 percent and with regard to production cost (income tax) in excess of 40 percent, cease to increase even proportionally. The property tax is supplemented by a resource tax when the payments are made not only dependent upon the fund amounts produced and the land but also upon the number of personnel. If the wage fund is used as the base for the payment for number of personnel, then the mentioned tax becomes a type of income tax.

It is our opinion that a resource tax is justified beyond any doubt when rent is withdrawn with its assistance. In order to stimulate collectives into using profit for investment purposes, this portion of profit must be taxed at reduced norms. Profit to be used for development purposes can even be released completely from taxation under certain conditions. The first joint Soviet-Hungarian enterprise Mikromed did not have to pay tax for its first 3 years, since all of its profit was to be used for further development.

Joint enterprises pay taxes on the profit remaining after withholdings for the reserve fund and other funds intended for the development of production, science and engineering. They are released from having to pay tax on profits for the first 2 years of their operations. The USSR ministry of Finances is authorized to lower the amount of tax. Cooperatives for the procurement and processing of secondary raw materials pay income tax for the first two years in the amount of 10 percent, the third year — 30 and commencing with their fourth year — 35 percent of their income.

The operations of an overwhelming majority of enterprises is characterized by fluctuations in profitability. At large enterprises, these fluctuations are less and at average and especially small ones — larger. However, they level off over an extended period and the total amount of profitability turns out to be close to average. In such instances, control over profitability with the aid of taxes does not raise any special problems.

The main problems concern unprofitable and low profitability enterprises which for decades have been categorized as social parasites. For example, in 1985 13 percent of the industrial enterprises tolerated losses amounting to more than 6 billion rubles. One out of every five construction organizations operated at a loss. Fifteen percent of the kolkhozes and sovkhozes operated at a loss (in 1986, more than 6,000 kolkhozes and sovkhozes). There are also branches and sub-branches which operate entirely on a loss basis, for example the meat and dairy, coal, housing-municipal economy and a number of types of municipal transport.

What is the fate of these unprofitable branches and enterprises? Ideally, the hopeless unprofitable and low profitability enterprises should be closed down. In principle, this is carried out best during the stage of plan development, before the collective or society sustains losses. Such actions are still not being carried out. Another portion of the unprofitable and low profitability enterprises includes those which are in need but temporarily "sick." They are in need of "treatment": renovation of management, adoption of measures for dealing with negligent suppliers, issuing of credit and so forth. Among the measures affecting society in the interest of reducing losses — subsidies which decrease from year to year and are abolished completely upon the expiration of a definite period of time (not more than a five-year plan). If enterprises save a portion of the funds allocated — these amounts ideally should be left for stimulation and if on the contrary an over-expenditure occurs — it should be covered at the expense of the enterprise.

It should be borne in mind that a portion of the new construction projects operate on a loss basis. As a temporary phenomenon, this is inevitable. But even as a temporary factor, it must be reimbursed by means of credit. Among enterprises considered to be rather profitable, there are a number whose profitability is

extremely high. Moreover, the lion's share of this profitability is not the result of work performed by a collective; for the most part, it developed historically as a result of conditions, decisions and circumstances which were advantageous for these enterprises. Thus, prior to exhaustion of the "external" forces which gave rise to such a high and explosive level of profitability, a need arises for actively controlling it. For enterprises with especially high profitabilities, fixed payments should ideally be introduced on a temporary basis in the form of a single payment computed for its ministry.

The creation of an effective mechanism for stimulating efficient management, which inwardly includes a mechanism for strict responsibility for inadequate production results, will interest all collectives in working in a better manner. The number of weak enterprises will decline sharply. The overwhelming majority will raise profits — their own and that of the state. Differentiation in the wage amounts and in the sources for development will increase, but the chief field for its dissemination will be the zone of increasing and not decreasing income, the "plus" zone.

#### Footnotes

- (1) Part II will be published in a subsequent issue.
- (2) K. Marx and F. Engels. Works. 2d edition, Vol. 19, p 18.
- (3) K. Marx and F. Engels. Works. 2d edition, Vol. 46, Part I, p 229.
- (4) Sergeyev, A. Economic Mechanism for Accelerating Socio-Economic Development. VOPROSY EKONOMIKI. 1986, No. 1, pp 20-22
- (5) EKONOMICHESKAYA GAZETA. 1987, No. 2, p 7
- (6) The tax terminology for the mentioned payments was not used for a considerable period of time. They were referred to as payments into the funds and as withholdings from profit for the budget. But the new method for determining these payments according to the nature of their taxation requires adequate titles. The sphere of use of taxation regulators is increasing. The USSR Draft Law Governing an Enterprise (association) has finally legalized the term.

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[No 9, Sep 87 pp 10-19] Part II. Prerequisites for an Effective Self-Financing Mechanism (1)

[Text] The formation of a self-financing mechanism that will be adequate for modern conditions is a complex task. The economy, merely for convenience of administration, is divided into separate compartments and has "partitions." It is actually a single organism. Similar to

doctors, economists must evaluate the situation and treat each organ depending upon its direct and inverse, momentary and postponed and direct and immediate relationships with the organism as a whole. In the case of an isolated and atomistic approach, the possibility is not excluded that changes in one sphere will be incompatible with changes in another, as a result of which the "integral" will not translate into an optimum situation. Self-financing is not very productive if the other spheres of economic activity, those which are joined together by the threads of economic nerve and circulatory systems, are not restructured.

Self-financing cannot tolerate restricted rights for collectives wherein the collectives, as a result of strict instructions, are unable to perform in the best possible manner and thus their financial results deteriorate (through no fault of their own). The absence of extensive rights reduces the degree of responsibility.

However, unnecessarily broad rights can lead to disproportions and to a weakening of economic discipline. Socialist society is capable of achieving an optimum combination of rights and obligations, independence and centralization and managerial principles in its economy. When distributing the rights and responsibilities among the central economic departments and ministries on the one hand and enterprises, production associations and labor collectives on the other, importance is attached to ensuring that the new methods for centralization conform to the new meaning being attached to independence.

Under the conditions of socialism, self-financing is subordinate to centralized decisions which express the interests of society on the whole and the requirements of a global if not local optimum. When the state considers it necessary to develop production operations which are unprofitable for collectives, then it can use the form of state orders and augment the force of an order by means of the advantages offered by an agreement. In order to observe the principle of complete responsibility of enterprises for their actions, collectives which are assigned mandatory but insufficiently profitable tasks are also extended various privileges simultaneously by the center (amortization, credit, price, tax and customs benefits, in accordance with the conditions for obtaining currency, the formation of wage and incentive funds, the awarding of bonuses and, in some instances, subsidies). In a number of cases, the assistance furnished to those who receive such orders takes the form not of an increase in profitability, but rather in priority deliveries of deficit materials.

The sphere of state orders must cover the production of goods which are needed by society but which are unprofitable for the enterprises. This includes, for example, the financing of certain unprofitable and low profitability production operations (municipal transport, housing and municipal services, departments of socio-cultural branches and others).

A most important trend in state orders is the production of basically new equipment. Naturally, such orders encompass products which the state itself purchases directly. By way of an example, allow me to cite the production of goods for a children's assortment at enterprises of the USSR Light Industry, where commencing in 1987 favorable norms have been established for withholdings from profits for the budget. The production of goods for this children's assortment is also encouraged by raised norms for withholdings for the incentive funds, for which the centralized funds and reserves of the USSR Ministry of Light Industry, the light industry ministries of union republics and the RSFSR Ministry of Textile Industry serve as a source (in the event the five-year tasks are exceeded). All joint enterprises are supplied on a priority basis. And those of them which function with socialist partners also are provided with limits for construction-installation work and material resources on a priority basis. The equipment, materials and other property imported into the USSR by foreign partners of joint enterprises, based upon their contributions to the regulated funds of these enterprises, do not require the payment of customs duties.

Centralized control over the actions of enterprises which are converting over to self-financing is facilitated considerably by the fact that the sphere of state control does not include all of the investment measures planned by collectives but only a comparatively limited number of them — objects with values that exceed a definite limit. It would appear that given the increasing singular capability of the objects and the large scales of technical re-equipping of production operations at the present time, the norms for above-limit capital investments should ideally be raised.

A centralized influence on investments is best carried out not post-facto, at which time a draft plan has already been developed by a collective, but during the pre-planning stage when computations are being carried out and the variants are being selected. It is at this time that a collective can determine the investment trends for its resources in large-scale installations. A state order for investment, one which supplements a state order for the output of the principal operation, is the result of such a comprehensive review. This type of state order must accelerate changes in the inter-branch structure for production and also the use of new equipment and technologies.

The preparation of state orders (similar to economic norms) commences prior to the collectives developing their own draft plans. Such a situation in no way is meant to imply that these plan regulators are computed independently of a centralized plan. If this were so, it would be in conflict with centralized control over the national economic proportions. The mentioned reference points are developed on the basis of a plan — not a final but rather a preliminary plan. It is preceded by practically the same volume of plan computations as employed today, only a considerably fewer number of

regulators is approved. Indeed, in order to establish a minimum number of indicators, information must be available on a considerably larger number of contacts and improvements. In order to weigh the above-water portion of an iceberg, one must know its submerged base. Meanwhile, some economists draw a conclusion regarding the separation of economic norms from a plan from the pre-plan establishment of control figures (2).

If we recognize the new concept of centralization, then all of the remaining economic "space" falls in the zone of enterprise independence and mutual coordination. Within the limits of this "space," enterprises carry out long-range and operational-tactical functions and not only tactical, as borne out since the early 1930's and continuing up until the present time. "Leaders" stated M.S. Gorbachev, "are presented with broad rights not only for a tactical economic maneuver but also for achieving long-range goals within the framework of a five-year plan and beyond its limits" (3).

Specifically, the mechanism for combining both principles of democratic centralism can be illustrated using the following examples. In 1987, the number of approved tasks in machine building was reduced sharply. A trade order formed taking into account the results of wholesale markets for the sale of goods and the principal types of raw materials and other materials is becoming the basis for the preparation of plans by light industry enterprises. At the same time, enterprises obtain from their ministries beforehand the economic norms and tasks for the production of their principal nomenclature of products in a natural expression and for placing in operation production capabilities and socio-cultural installations by means of centralized capital investments. Small light industry enterprises in Estonia, based upon norms, limits and consumer orders, develop their own plans themselves (4). In connection with the presentation to a number of enterprises of the right of independent emergence on the foreign market, tasks are established for them in connection with currency earnings, including in convertible currency.

From the standpoint of current and even more so future conditions, many unnecessary limitations are still in effect. An attempt will be made not to violate agreements only when more effective sanctions are imposed for breakdowns in such agreements. As a result of this, a requirement no longer exists for maintaining an indicator for overall sales volume, which serves at the present time for comparison against unfulfilled obligations, in the interest of ascertaining their proportion of the overall planned output and determining the measure of punishment.

Wage funds which are determined by raised norms, by the ratio between an increase in average wages and raised labor productivity and by a fund norm for leading workers, ITR's [engineering and technical workers] and other office workers are regulated. Where there is interest in optimization of final results, the existence of these

norms becomes unnecessary and also the present limited rights of leaders relative to the structure of enterprises and the systems employed for salaries.

The use of stronger economic stimuli ensures the observance and even a reduction in the normative construction periods and in the norms for mastering production capabilities, it also excludes investments in which the reimbursement is lower than the normative amount and it eliminates an increase in the demand for construction-installation work and contractual services. As a result, the need for appropriate norms and limits declines. Obviously, in the future there will be no need for supply limits, norms for material resource supplies or for special tasks for lowering material expenditures (the latter are employed in machine building).

Non-funded wholesale trade, introduced in 1987 for 10,000 consumers, and supply by means of wholesale trade for construction projects in Estonia and Armenia can be considered as the first serious experiment in supply operations under the new conditions. Work carried out commencing in 1985 (involving four ministries) by enterprises, under conditions of strong direct long-term economic relationships, was similar to the above. At the end of 1986, approximately 25 percent of the overall volume of deliveries in which USSR Gosnab organs participate was carried out on the basis of direct long-term relationships.

The schedules for converting over to wholesale trade in the means of production must be established taking into account a proper balance between marketable goods and monetary resources, the introduction of wholesale prices which reflect the consumption parameters of products and the operational reliability of the organs of supply. If this is not done, the wholesale trade can lead to an increase in supplies, an event which occurred during the first quarter of 1987 in the Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] System, where the supplies of rolled metal exceeded the norm by one third.

Although the idea of a state order received "civic acceptance," in actual practice it is realized in the form of an allotment of the most important nomenclature. Even during 1988, a state order will encompass this particular nomenclature and it will be "receipted for," that is, it will appear only formally as an agreement between the state (in the person of a ministry) and an enterprise. Such an order is more accurately considered to be a former state task. It is partially conditioned by the fact that present prices do not direct collectives into the channel of social interests. Here the traditional approach derives from the fact that a dogma exists which holds that correct decisions are within the capability only of higher elements and that any tasks must necessarily take the form of address directives, with cost accounting appearing only as an implement of the plan.

It is believed that good cost accounting can ensure the formation of many correct decisions, both from the standpoint of an enterprise and from the point of view of society. That which cannot be accomplished by cost accounting, as already noted, can be accomplished by state orders. Under these conditions, a plan becomes not a collection of indicators but rather a summation of vertical and horizontal agreements. Cost accounting is transformed from a passive continuation of a plan into an economic instrument which enters into dialectical unity with the plan. Here the unity of a plan with the market, achieved with the aid of "penetration" of value into the plan and the plan into value and into its formation and change, can serve as an analogy. In this manner, a harmonic combination of the various aspects of all of these conflicting unities is achieved at the level of "higher mathematics" for the economic mechanism.

Self-financing requires a new attitude towards the reserve funds for the principal economic element. The reserves are created as a result of an objective irregularity in the formation of income and expenses during the period in which the results exceed the expenditures. They enable collectives to boldly tolerate temporary and small deviations from the standpoint of growth in effectiveness, such that they will subsequently be able to undertake larger actions. Here the answer consists of new special purpose arrangements for the expenditure of funds for developing production, science and engineering, which call for savings in resources for the purpose of financing expenditures for the technical re-equipping, modernization and expansion of production, the preparation and mastering of new and modernized products and compensation for the raised expenses for such output during the developmental period.

Industrial enterprises which have converted over to self-financing form their financial reserves in an amount up to 5 percent of the profit added to the funds for the development of production, science and engineering and to the funds for socio-cultural measures and housing construction; in light industry — up to 5 percent of the profit remaining at its disposal. The reserves are used for additional expenditures for the development and introduction of new equipment, for compensating for the shortage in internal working capital and in the light industry — also for covering losses caused by a reduction in prices or a mark-down in goods. The use of reserves for raising wages is not tolerated, since this lowers their role in reproduction. In the wage reserves, that portion which exceeds the normative ratio between growth in average wages and an increase in labor productivity is counted; they are intended not for balancing income and expenses under difficult conditions, but rather for improving good indicators.

If all incentive funds are developed in accordance with a "base," then minimal reserves are needed. If the fund for the development of production, science and engineering is truly earned and "fluctuates," then a considerable reserve is needed for it and for the two remaining funds — a minimal reserve.

Withholdings for the financial reserves of enterprises are presently being carried out in small amounts, since large amounts would lower the incentive funds sharply. This is not always pleasing to the collectives, since they continue to hope that during a critical moment they will receive assistance from the ministry's reserves. This type of assistance must be eliminated entirely and measures must be undertaken to ensure that collectives rely only upon their own strengths. They will then be imbued with proper concern for their reserves.

In addition to reserves and under the conditions imposed by self-financing, an objective need arises for a second "shock absorber" for the irregularity between income and expenses — credit. When planned expenses are financed on a centralized basis by income, then there is almost no requirement for credit (upon the condition of plan fulfillment). It is required mainly only when the plan is under-filled or over-filled. It comes as no surprise to learn that the proportion of long term credit in the sources for financing capital investments now amounts to 5-6 percent. In the sources for the formation of working capital for the national economy, it exceeds 57 and in industry — 51 percent. Here the high proportion of credit is explained by its "invasion" into the sphere of working capital norms. If this were not the case, its proportion would be extremely modest here.

In the case of self-financing, an excess of funds inevitably occurs during some periods and in others — a shortage. In order to ensure that the "surplus" does not lie unused but rather produces income, it takes on the appearance of a contribution in behalf of an enterprise within a credit organ. This contribution is used to assist enterprises having a shortage of funds, for which they pay a loan percentage which exceeds their deposit percentage. In this manner the computation of percentages for net funds is coordinated with the source for their payments — the collection of percentages from enterprise-customers who receive loans. Credit becomes an indispensable element of the system for the functioning of enterprises and it is organically included in the plans for their financing.

The value for the percentage amount increases sharply at the same time. In particular, loan percentages must be at a level which will ensure conformity between the amount of the loan fund and the demand for it. When a loan fund is low and the demand for it is high, the percentages should be raised; when the loan fund is high and the demand for it is low — the percentages should be lowered.

The interest policy must be flexible and not restrained by strict circulars or patterns. If a lowered percentage rate can initially be covered by a heavy surge of effectiveness eventually, then such a measure is fully justified. If credit investments in certain spheres of activity should be restrained, then the issuing of funds at a high interest rate is one of the best regulatory methods.

True, the present interest rates for loans are symbolic in nature. The percentage rates for fines are somewhat higher and yet they do not play and cannot play a substantial role. If everything remained as in the past, then the use of credit would lead to artificial growth in the income of collectives and to an increase in the funds for self-financing.

Making use in their circulation of all of the temporarily free resources of enterprises, the banks compute to their advantage the deposit percentages only for the surplus resources in the accounts for the funds for developing production, science and engineering and, in the future, for social development. The interest rates are computed also for the free surplus resources of enterprises in foreign currency, intended for the repayment of Vnesh-torgbank [USSR Foreign Trade Bank] credits. No interest rates are applied to collectives for the surplus funds in other accounts. Interest rates are not computed for claims and suits concerned with the payment of fines and forfeits. This reduces the input into the self-financing funds and requires a conversion over to computing deposit percentage rates for all bank funds used by enterprises, with a deduction for payment for bank services. In the event of the creation of joint enterprises, with the participation on the one hand of soviet organizations and on the other of firms of capitalist or developing countries, the percentage rates are computed for the total amount of funds included in all of its accounts and in foreign currency — based upon the rates for the world monetary market.

The banks issue loans to the enterprises when they have a shortage of funds required for developing production, science and engineering or for socio-cultural measures and housing construction. At the same time, they do not extend credit for shortages in the wage fund. Credit is extended on the basis of accounting documents by way of ensuring payments for planned wages but for nothing more. These funds need no longer be increased, since everything that is needed by an enterprise for wages is planned for it. In the case of self-financing in its developed form, the wage fund will develop depending upon the distribution of the created value. Thus it may no be enough. Here credit is needed. Naturally, if future income will make it possible to repay the loan. It turns out that credit for wages becomes just as proper as for equipment, construction materials and other means of production.

It has been stated quite fairly that the commodity payments for wages are limited and scarce. But equally scarce if logistical support for loans for development. This must restrain the presentation of all types of credit, but it will lead to an expansion of all of its types as the scarcity is overcome.

Serious attention must be given to the mechanism for the reimbursement (return) of loans, which earlier disturbed nobody. For example, it was established that loans for

the creation of fixed capital are subject to reimbursement mainly from profit. But if the profit equalled the average value and if a normal interest rate was withdrawn from it for credit, then a normal cost accounting income would remain as surplus. Its use for the return of loans would undermine the financing of expenditures for which this income was created. A natural source for the reimbursement of long-term loans and one which will not disrupt the requirements for reproduction could be that of amortization for renovation. In the presence of above-norm profit, use can be made of it. However, such a situation should not be viewed as the norm (it is more of an exception than the rule).

The system of self-financing clearly responds to the comparative profitability or unsuitability of various measures and it is conditioned by existing differences among individual types of incentives (penalties). Recently there has been a reduction in the autonomous indicators for the issuing of awards and yet the disparities associated with this have not been overcome entirely. A favorable system exists for the distribution of price mark-ups, up to 70 percent of which is added to the incentive funds. This exceeds to a considerable degree the proportion being added to these funds from the remaining managerial factors. The profit obtained as a result of the production of consumer goods from waste products is distributed in a special manner. Penalties for the non-fulfillment of obligations in connection with product deliveries in 1986 were, by way of an exception, added to the incentive funds. In accordance with decisions handed down by central and republic planning organs, some enterprises cover these obligations, either fully or partially, by means of profit. The action of such "differently weighted" incentives and penalties produces a situation in which the collectives select not those measures which produce a truly great effect for society or minimize the inevitable losses, but rather those which provide incentives in especially high amounts or penalize to only a weak degree. Here it is easy to maneuver.

Self-financing at the level of the principal economic element requires the restructuring of internal cost accounting. Properly speaking, a collective contract for departments and sectors and a brigade contract — these are all only names for true internal cost accounting. Similar to self-financing, cost accounting at the enterprise level is a contract of an enterprise and its entire work collective.

It appears advisable to expand the list of categories of manual and office workers with whom agreements are concluded calling for complete material responsibility, to develop in every possible way a comparison of results, measured according to internal prices, against the expenditures which affect a given subunit, to utilize when it is feasible to do so the indicator for profit in accordance with internal cost accounting and to form from profit the decentralized portion of incentive funds within an association.

Every attempt should be made to ensure that fixed capital is included in the "balance" of brigades and its existence made known in the working areas. The members of brigades will then monitor its safe-keeping, ensure timely repair operations, strive to reduce its cost and carry out some of the work themselves (when this work is not very complicated, does not cause harm to the principal operations and costs less than the work performed by specialized services).

The idea of introducing an internal rental payment for the use of productive capital is worthy of attention. Indeed, internal subunits are not on complete self-financing and thus they experience a surplus of capital only through growth in production costs. If this growth is not sufficiently perceptible, then a rental payment may turn out to be useful (with such a payment, there will be no surplus capital).

The conversion of brigade collectives over to cost accounting must be carried out in a manner such that an evaluation of their work and wages is not based only upon their own work but is necessarily dependent upon the collective of the next and higher level. And this applies to an enterprise (association) on the whole. Otherwise a brigade loses interest in the overall task and becomes isolated from the collective of a sector, department or enterprise. In order to ensure a link between a brigade and a sector, a portion of the wages of the brigade members must be dependent upon the operational results of the sector.

Sanctions are needed for disruptions in the tasks of internal subunits of an enterprise, sanctions which will compensate for the damage sustained and call for reimbursement at the expense of the guilty parties. Measures aimed at strengthening internal cost accounting must be carried out in conformity with the characteristics of each enterprise, while remembering that the internal mechanism constitutes an area of competence for a collective. Thus use can be made of various organizational structures for enterprises, various operational regulations for specialists of the same profile, different incentive (penalty) amounts and different forms for such incentives.

The existing forms and methods for interrelationships between enterprises and organs of branch administration must be reviewed. They must be employed for distributing the state orders among the collectives and thus they must participate in the preparation of branch plans on the whole, they must finance the more revolutionary scientific-technical works and certainly they must generalize and disseminate leading experience in the sphere of labor and administration. They may have attached to them foreign trade firms, cost accounting general branch NII's [scientific research institutes] and installations of a general branch nature. A conversion over to voluntary "horizontal" associations for all or a part of the branch's enterprises and at times a number of branches is also possible. The foundation for this was established by an experiment carried out in Poti, Tbilisi, Sukhumi, Kutaisi

and Rustavi, where TMO's [territorial inter-branch associations] for the collection and processing of waste products and for the redistribution of above-norm values were created.

Self-financing for the principal production element assumes that the higher economic organs must be materially responsible for their own mistakes. Towards this end, their funds must include special reserves. If branch organs begin directing the economy, then in essence they serve in the role of super-combines or concerns which can and must operate on a cost accounting basis. Thus it is fully logical, for example, for new territorial all-union construction ministries to be established on the basis of cost accounting principles. If the branch organs remain purely state in nature, as extensions of USSR Gosplan, USSR Minfin [Ministry of Finances] and others, then cost accounting can hardly be justified in them. With regard to the material responsibility of branch organs for their own actions (or for an absence of action), it is required for any functional purpose. Thus, special reserve funds are required in all instances. They can be created either through a reduction in payments into the budget or directly using state budgetary funds.

Economic restructuring required comprehensive democracy, which constantly guarantees an interest in the masses in accelerating progress and combating negative phenomena and processes. This is achieved with the aid of glasnost, accountability, criticism and self-criticism and self-government by the people. Priority importance is attached to democracy in production. The electivity of leaders and the allotting of decisive authority to the soviets and general meetings of labor collectives in connection with a broader range of production, social and personnel processes, than was earlier the case are viewed as a logical continuation in the expansion of the rights of collectives in planning, financing and other spheres of activity. This conforms to the policy of complete responsibility of enterprises for their final production results.

In order to ensure that the indicators for enterprises and branches, under the conditions of self-financing, will never be improved by means of a monopolistic status for producer-enterprises and that nobody will be satisfied with the results already achieved but rather will constantly strive to move forward, a radical change is required in the system of economic competition. Competition can be strengthened if several producer-enterprises are created on a centralized basis for the purpose of satisfying particular requirements. In this manner, their monopolistic status will be overcome. Importance is attached to ensuring that the consumer-enterprises freely select their own partners during the stage of pre-planning computations, with wholesale trade in the means of production and with the competitive presentation of state orders and the selection of plans for new equipment, technology and construction installations. In a number of branches, a competition will take place between state enterprises and cooperatives and also

commodity producers engaged in the sphere of private labor activity. The centralized balances for goods and services must be converted over from quantitative coordination to qualitative-quantitative coordination. In the process, importance is attached to ensuring that the plans include first of all the best products, with the worst being excluded. But the chief concern in the area of competition consists of ensuring freedom of selection and interest on the part of each purchaser in acquiring better and relatively cheap products and during the periods when they are needed.

A selection of partners is realistic when they have the possibility of increasing the production of goods which are needed and improving their quality. And this in turn is dependent upon the economic mechanism available to both sides. If the principal financial flows for investment are determined from above and the collectives do not have adequate funds for investment, then they can hardly respond to the demands of customers. Self-government and self-financing release not only the energy of demand, since consumer-enterprises have rights and income at their disposal, but also the energy of supply, enabling the producers, by means of increasing earnings from the sale of improved products, to accelerate independently an increase in their production and further progress in their own production.

Under socialism, competition excludes monopolistic tendencies and this is manifested in general openness and in the availability of leading experience. Quite often it is generally made available free of charge. Under conditions involving a strengthening of cost accounting principles, in those instances where initial experience requires large expenditures, its further circulation should ideally be carried out for a payment. In essence, it signifies share participation by enterprise-followers in covering a portion of the expenses of the pioneer-enterprise. Otherwise the initiators of new innovations, compared to those who follow, would not receive their just reward. As the saying goes, instead of being paid they would have to pay. And this would reduce the number of those desiring to play the former role. With regard to enterprise-followers, the use of somebody else's experience free of charge, with expenses being taken into account only partially, is equivalent to violating the principles of income and earnings and balance in expenditures and results.

The effectiveness of self-financing is raised when it is possible to include all partners in the number of participants in the distribution of income, including suppliers, allied workers, contractors, transport workers, electric power workers, outfitters, trade organizations, scientific research institutes and design bureaus. In the case of complete cost accounting, an enterprise is authorized to transfer a portion of its economic incentive funds over to its suppliers and other enterprises. According to the law governing an enterprise, it is authorized to issue material incentives to workers attached to medical, children's,

cultural-educational and athletic institutions and organizations which provide services for a labor collective and are not included in its structure. In addition, a portion of an incentive fund can be set aside for awarding bonuses to workers attached to service enterprises, with whom contracts were concluded for providing services for workers assigned to multiple-shift regimes. It is our opinion that it is generally not necessary to establish a list of those who an enterprise wishes to issue incentives to from its own funds; rather it is better and easier to list those who should not be issued such incentives.

As you can see, the idea concerning "secondary" distribution of incentive funds is being developed further. In the future, we expect that the solution for this problem will be sought through the introduction of appropriate prices in accounts maintained with partners. When price formation becomes more oriented towards the consumer parameters for output, then this method for distributing results will become the dominant one.

The validity of the self-financing funds of enterprises is dependent not only upon a correct determination of material expenditures or production costs on the whole but also upon the price levels for the products produced.

The effective wholesale prices are mainly "expenditure" in nature. With a concentration in the production of a particular product at one enterprise, their level gravitates towards individual expenses and in the production of similar products by a number of enterprises — towards average expenditures. Under such conditions, it often happens that the higher the expenditures (and the profit involved), the greater the prices. Such prices are not dependent upon how goods are evaluated by a thrifty consumer but rather upon how they appear to the producer. Paradoxically, it appears just as costly to a productive consumer today. And for such a consumer the higher the price for the equipment and materials obtained, the greater will be the production costs for his own output and, it follows, the greater will be the funds for wages, reimbursement and profit. Thus, such consumer-enterprises force growth in the prices for ingredients used in their production operations, they are the first to object to a reduction in these prices and they block thrifty purchases. Typically, following the establishment of the rule concerning confirmation by the consumer of the effect declared by the supplier, this effect exceeded the price approved by Goskomtsen [State Committee on Prices] by 10-30 percent and for one out of every three commodities — by more than 30 percent.

When the expenses per unit of usefulness increase, then an increase in a monetary evaluation embellishes the dynamics of effectiveness. Since the "expenditure" approach favors growth in prices, or in any case it restrains a reduction in them, its use reduces the importance of monetary indicators of economic development.

The "expenditure" approach brings about an unjustified lowering of prices. It takes place for those products the production expenses of which are lower than the result. For example, this includes petroleum, fresh water and others. Such prices provoke consumers into the wasteful use of purchased products and they restrict the humble profits of producers by limiting the rates for their growth. When specific expenses decline, the growth in an "expenditure" evaluation lags behind an increase in the consumer effect and the real, "physical" increases in production and national income turn out to be higher than the value increases.

Prices which reflect the effect of the output produced furnish a true description for enterprises and in the final analysis consumers can furnish this evaluation. At such times, the best products are valued higher. Thrifty production operations, the cheapness of which is not trimmed by lowered prices, becomes profitable.

Each collective-producer is simultaneously a consumer. As such, during the course of self-financing he loses (wins) on the basis of expenditure prices and he loses (acquires) that which he won as a producer. Thus the producers have started a campaign for sound price formation, one which erects natural obstacles along the path leading to an increase in prices for the goods of all producers.

With the conversion over to self-financing, even in its initial forms, the work is stimulated not by "quantity but rather by skill." Thus 13,000 workers were released by the Belorussian Railroad. The dissemination of this experience to all roads throughout the country will make it possible to reduce the number of workers by 250,000-300,000 by the end of the five-year plan. A considerably greater effect is expected from a conversion over to a developed and consistent variant of self-financing, especially through its effect on accelerating scientific-technical progress with its typical characteristic—reduction in the labor-intensiveness of production and the release of labor resources. In those areas where five workers were needed in the past, soon only four will be required and in the future— even less. This is attaching greater importance to the problem of employment for those workers so released. If effective solutions are not found, then either the threat of unemployment will arise or it will become necessary to discard the mechanism of self-financing and retain a surplus number of workers at the enterprises.

Up until now, the situation has been quite different in our economy: there has been an excess of working positions and a shortage of man-power. Thus the proposed solutions produced a situation in which it became necessary to slow down the growth in new capabilities, to find additional labor resources and to place surplus fixed capital in operation. Even in the plans, a considerable number of working positions remained unoccupied. Actually, the situation was even worse. Thus, according to data obtained on the basis of an impressive study

carried out by the Scientific Research Economics Institute of USSR Gosplan, the number of workers at enterprises, taking into account the actual use of capabilities, exceeded the planned number by more than 20 percent.

This phenomenon had become so common that a change in the situation was not felt initially. There were very few who believed in a discharging of labor resources. And suddenly—as thunder is heard coming from a clear sky: hundreds of people turned out to be unemployed in a settlement along this same Belorussian Railroad. But indeed this was only one of the first signs. This discharging of labor resources will become stronger. Accordingly, a new mechanism for employment is needed, one which includes a forecast for such discharging, the uncovering of opportunities for ensuring employment in the various areas, a determination of the number of workers required in other areas and the creation of new jobs for them. Under these conditions, a substantial improvement is needed in organizing the work of the state service for reclassification and a review should be undertaken of the system which calls for the state to pay out bonuses, added on to wages, for the mastering of a new specialty and also allowances for time spent undergoing retraining or acquiring a new profession.

Self-financing is not the only form for production management. For a number of spheres and enterprises, the best form continues to be that of irreversible budgetary financing. The following are financed from the budget: fundamental scientific studies and priority developments in the field of NTP (scientific-technical progress); more revolutionary technical and technological innovations; pioneer development of new territories; search for and initial prospecting for minerals; measures for the introduction of equipment which will raise the creative nature of labor, improve safety procedures, protect the environment and expand exports when the economic indicators are still not very high.

Naturally, budgetary financing is also being employed for the social consumption funds and for expenses associated with the functioning of the sphere of social administration—at the national, inter-branch, branch and territorial levels. A certain amount of intra-branch redistribution of financial resources, which must be regulated at the ministerial level, is also needed. The well known deviations from the principles of self-financing are possible at the level of enterprise groups or within enterprises, when certain expenses that are not compensated by income occur.

At the present time, the formation of self-financing relationships is in the earliest and first stage. And certainly, there are many problems which demand solutions. But the difficulties associated with self self-financing must not dampen our ardor in carrying on this important and very promising work. Importance is being attached to mobilizing our efforts in the interest of bringing about radical improvements. A need also exists for constantly bearing in mind that success will depend

not only upon making bold decisions but also carrying them out in a practical, organized, training-professional and ideological manner. The party and masses must display determination and wage an uncompromising campaign in behalf of each forward step taken.

**Footnotes**

(1) Continuation (see Issue No. 7 for this year for leading article)

(2) Saginevich, A.V. Final Results and Operational Indicators of Enterprises. Moscow, NAUKA, 1986. p 59.

(3) Materials of the Plenum of the CPSU Central Committee, 27-28 January 1987. Moscow, Politizdat, 1987, p 53.

(4) EKONOMICHESKAYA GAZETA, 1987, No. 17, p 18.

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## LABOR

### Year End Summary of Labor Production Statistics 18280027 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Dec 87 p 3

[Article by I. Lobanov, TASS correspondent, specially written for SOTSIALISTICHESKAYA INDUSTRIYA: "Industry at Year's End"]

**[Text]** A year which has been difficult for the national economy is coming to an end. It can already be stated with assurance that the results of the first 11 months have created the necessary prerequisites in industry for fulfilling the annual plan as a whole. The TASS correspondent requested I. Pogosov, deputy chairman of USSR Goskomstat [State Committee for Statistics], to tell us about the basic directions in industry's work. He does so as follows:

The total volume of industrial production has come close to the preplanned level, and the plan for profits has been fulfilled. This overall appraisal must be supplemented by qualitative characteristics. From the standpoint of intensifying production our attention and efforts nowadays must be switched from quantitative indicators to qualitative ones, to end results, and to increased efficiency. The important factors here are scientific and technical progress, conservation of resources, and structural changes.

A qualitatively new phenomenon may be traced in the utilization of labor resources. The number of industrial-production personnel has stabilized, and there is even a tendency toward its reduction. If during the 11th Five-Year Plan its average annual increase amounted to more than 20,000 persons, in 1986 it rose by only 121,000 persons, and from January to November of 1987 the number of persons employed in industry actually declined by more than 140,000. Thus, the growth of industrial production during the current year is being achieved for the first time with an absolute reduction in the number of employees.

This circumstance is creating new possibilities for altering the distribution of the new replacements of labor resources: it facilitates laying off a number of employees in the material-production sphere as a whole and ensures an increase of labor resources in the non-production sphere.

New quality in growth is also tied in with replacement of the items being produced by new ones, while upgrading their technical-economic parameters and quality. Moreover, this applies primarily to machine building, which plays a decisive role in scientific and technical progress. While it is still too early to speak of principal changes in this area, certain hopeful tendencies have begun to appear. The proportion of items whose output has been mastered for the first time in the USSR, within the total goods output from January to September 1987, amounted to 7.2 percent, as compared to 3.1 percent in

1985 and 4.3 percent in 1986. Moreover, we have carried out our assignments regarding the output of the most important types of products, those which measure up to world technical standards. In connection with the introduction of the state acceptance system, there has been a substantial strengthening of technological discipline, and the quality of performance has improved.

Nevertheless, many problems have not yet been solved in the development of machine building. Speeding up the replacement of fixed production capital and, above all, its active component requires machine building to develop at an advanced pace. According to the calculations made for this year's plan, the increase in the machine-building complex's output should outstrip industrial production as a whole by a factor of 1.6; but, in fact, this advance has amounted to only a factor of 1.1. Industry as a whole is developing in accordance with its plan assignments, but machine building has lagged behind and has not provided the intended structural changes. It has complicated the withdrawal of obsolete equipment from the production line and delayed retooling in the national economy.

In talking about structural changes, we must mention yet another circumstance. Industries of the fuel-and-energy complex are successfully coping with their obligations. This is gratifying per se, and it creates favorable possibilities for economic development. However, the necessary structural changes have not been achieved. According to the calculations, the advance pace in total volume of industrial production in relation to the growth in the fuel-and-energy complex's output should amount to a factor of 1.8; but, in fact, during the first 11 months of this year it came to a factor of 1.2. Thus, the necessary economies in fuel-and-energy resources were not achieved, and this has retarded the growth of production efficiency as well as positive structural changes.

The chief indicator characterizing the output of products necessary for the national economy is the fulfillment of contractual obligations with regard to deliveries. For the 11-month period it amounted to 98.3 percent. As may be seen, the most difficult 1.7 percent still remain. Moreover, a patently negative tendency is to be observed here, whereby enterprises, to the detriment of their obligations to consumers, produce more products as calculated by total volume by means of items which are not in demand but, for some reasons convenient to them, here the mechanism of economic incentives to fulfill their obligations with regard to deliveries is still not operating.

During the 11-month period there has been an increase in the production of the most important types of consumer goods—food products, light-industrial goods, cultural, everyday, and household items. However, the situation regarding the population with certain items remains complicated. Enterprises under the USSR Ministry of Light Industry were 1.1 billion rubles short in their product output, and one out of every three enterprises has not met its delivery obligations.

These shortcomings in the development of consumer-goods preparation make it difficult to balance the population's effective demand with the mass of goods and services being offered; they also make it hard to eliminate the shortages in a number of items.

The year which is coming to an end has proceeded under the aegis of preparing many industrial enterprises to convert to full cost accounting and self-financing beginning in January 1988. Contracts are being concluded, norms are being revised, as is the financial security of production; specific production programs are being formulated, and problems of production efficiency are being worked out. The foundations are being created for industry to operate steadily during the coming year.

2384

**Plant Complains in Open Letter of Poor Working Conditions**

18280025 Moscow *TRUD* in Russian 8 Dec 87 p 2

[Unsigned article: "A Plant on Its Own: An Open Letter to Yu.A. Bespalov, USSR Minister of the Chemical Industry"]

[Text] Esteemed Yuri Aleksandrovich!

We've written to your ministry twice but have not received a reply. At the behest of my comrades, I've now decided to appeal to you through this newspaper.

As you know, our plant produces electric-insulation tape. It is eagerly purchased by our country's enterprises and by those in 14 foreign countries. I can say without boasting that for more than 10 years now we've had no complaints made against our product; we supply high-quality tape.

But you should see the conditions under which we make this product that is in such very short supply. The plant is situated within the walls of a former weaving mill built at the beginning of this century. The wooden floors and columns became rotten long ago, and the walls have sunk partway into the ground. If you go into the shop, you don't know whether it's a shed or a cellar. To be sure, in 1968 modernization was begun. But it's being done mainly for appearance's sake. During this time period—almost 20 years now!—they could have made major repairs or even built a brand-new enterprise of equal capacity. Now all is quiet at the construction site...

It's clear that for the Ministry of the Chemical Industry and for the Gusevskiy Steklovolokno Production Association, of which we are a part, the main thing was always that the plant fulfill its planned quota, and nobody was disturbed about the cost. Let me note just one detail: since 1982 the illness rate in the collective has almost doubled. If we total up the time lost, it turns out that because of this factor the enterprise actually stood idle for an equivalent of 10 days last year.

The people go to work in a gloomy mood. They like the work, and their friends are here. But when they think about the drafts, the dampness, the constant rain leaking through the ceiling, the semi-darkness, and that they have to breathe air which is saturated with glass dust, they don't feel quite right. There are not even the most elementary things like ventilation or coat-rooms.... But what's the use of talking about such everyday amenities if a number of the shops have long been in a state of emergency...?

Of course, the administration and we ourselves are to blame in all this. We should have been more persistent in bringing about changes. Recently our collective elected a new director for ourselves. But along with a load of old problems, V. Barnov also acquired from his predecessor a bulging file-folder full of correspondence with managers of the Soyuzplastpererabotka VPO [All-Union Production Association] and the Gusevskiy Association.

The oblast trade union council likewise tried without success (and also not firmly enough) to draw the Ministry of the Chemical Industry's attention to our situation. It was not until this past spring, when one of the weaving shops was closed down at the insistence of the technical inspection office, that the ministry headed by you reacted to a message from the oblast trade union council. To be sure, it was extremely peculiar. The ministry was not disturbed in the least by our difficult situation or by our outrageous working conditions, but solely by the fate of the plan. In reply to the ban on using the broken-down shop, your deputy, V. Torbenko, sent a telegram in which he requested that "by way of an exception temporary permission be granted to use this production line...." The Ministry of the Chemical Industry, he said, would guarantee the modernization of the principal structures prior to the end of November.

It's not proper for me, a simple worker, to give instruction to a deputy minister. But, you know, elementary logic and ultimately the law require that safe working conditions be created first, and then one can think about output. Fortunately, the trade unions here did not back off from their standpoint (as, unfortunately, happens frequently). The shop in question has remained sealed to this very day. The promise to finish modernization in November was not kept. And so what, may be asked, are the protestations of your deputy worth?

Obviously, the stereotypes of past years are still alive and hanging on. They date from a time when people were the last to be thought about, when a rigid, administrative... style of leadership ranked first, and the plan had to be fulfilled at any cost. How is it possible on the one hand to talk about restructuring and, on the other hand, slyly shunt people into broken-down, accident-prone workshops? "Perhaps we'll get by; perhaps we can carry it off."

It would seem that particular concern should be shown for persons working under harmful conditions with regard to their life outside the plant—their housing and everyday conditions. But can it be called a normal life when they have to live in decrepit houses, most of which do not have the usual amenities? Unfortunately, there is a shortage of even such primitive housing. At present one out of every five workers must get in line for housing. We have no bathhouse, hospital, or dispensary.

All this is an obvious consequence of the "residual principle" in approaching the solution of social problems, a principle which the party has condemned. For a long time the RSFSR Ministry of Light Industry, within which we were included until 1973, did not contribute any funds to develop the enterprise or social and cultural life. Nor has the Ministry of the Chemical Industry coughed up any money. During the past five years, for example, we have not received a single ruble from the sector's headquarters for our social, everyday, and cultural needs, even though this plant generates half a million rubles in profits every year.

Keeping our collective on "starvation rations" for many years and compelling it to work, as they say, until it is worn out, the leading officials of the Gusevskiy Association intend to convert us to **self-support and self-financing**. We understand that this is a requirement of the times and is directed at increasing the production yield. But here's what we are very upset about. For years normal working conditions have not been created for this collective. How can we begin to live and work in the new ways starting in January if one-third of our production facilities have been halted, and if we are living and working under production and social conditions which are worse than others?

We understand that in the future the ministry will not have much to do with what we're talking about here. Their remaining concerns will be strategy and developing a technical policy for this sector. But we, the working collectives, will be the ones who will have to implement this policy. And its fate depends on our fate, on the specific situation at the plant.

Over the course of many years this plant has essentially extended credit to the sector every year. And what do we have? Backward production facilities and a poor, shabby housingstock.... That's why, in my opinion, we have a right to count on effective help and on the ministry's returning to us at least a portion of what it owes us.

It's also important at this time that we take into account how much in funds will remain in the enterprise's hands under the conversion to self-financing. Because, of course, we must have the possibility of modernizing the equipment and spending money on social, cultural, and everyday facilities. Here's where a carefully weighed approach is needed, as well as an analysis of the extremely complicated situation which has evolved at this plant. We are right to insist that, in this connection, the collective be consulted and that the workers' proposals be taken into account. We all need to work together in order to solve these problems; herein lies the guarantee of future successes.

[Letter signed: At the request of the collective, L. Kuzhelevskaya, weaver, Khoznikovskiy Fiberglass Plant, Lezhnevskiy Rayon, Uvanov Oblast] 2384

## CIVIL AVIATION

### Moscow-Teheran Air Route Reopened After Nearly 3 Years

18290011a Moscow *IZVESTIYA* in Russian 16 Oct 87  
p 5

[Article by G. Alimov: "A Tu-154 Flies to Teheran"]

[Text] At 0900 hours on 15 October an Aeroflot Tu-154 took off on Flight Su-515 from Sheremetyevo-2 Airport for Iran.

This is the first flight of a scheduled Soviet airplane to Iran after an interruption of almost 3 years. Air service between Moscow and Teheran was terminated in 1985 in a period of intensification of the military conflict between Iran and Iraq. And now Aeroflot is resuming flights to Teheran under an agreement with the Iranian side. They will be flown regularly, once a week, on Thursdays. The length of the air route is 3,100 km, flying time 3 hours 50 minutes.

The weather in Moscow was very favorable to commencement of the flights—fine dry weather in the morning, clear skies, and a light fog was dispelled by 0900 hours. As the *Izvestiya* correspondent was told in the traffic department of Sheremetyevo-2, the passengers on Flight Su-515 included V. V. Gudev, the new extraordinary and plenipotentiary ambassador to the Islamic Republic of Iran.

"Aeroflot's trips from Moscow to Teheran and back are very promising. There is great interest in them on both sides," said A. Alekhin, department chief in the Foreign Relations Administration of the Ministry of Civil Aviation.

I managed to talk a bit before the flight with the captain of the Tu-154 M. Reshetnikov. This is not the first time that he has flown this route.

"The air route is familiar to you. You probably see no particular problems...."

"You are wrong. Yes, I have flown to Teheran more than once, but for us pilots every flight, regardless of what number it is, is like the first one," Mikhail Vissarionovich said. "It has to be that way. Even if you have flown the route and know the flight conditions a thousand times, you still prepare for the trip as though it were the first. There are six in the crew, including myself. One slot is not part of the regular staff. We will have Anatoliy Goryainov, pilot instructor, in the cockpit with us. That is customary when you are starting up a line."

The flight will follow the route Minvody—Tbilisi—Baku—Caspian Sea.

The Aeroflot plane is expected to return to Moscow on the return flight on 15 October.

07045

### AN-74 Undergoes Final Testing Prior to Acceptance

18290011b Frunze *SOVETSKAYA KIRGIZIYA* in  
Russian 30 Oct 87 p 3

[Text] The red-winged plane raced away over the concrete runway of the test field of the Kiev Aviation Plant and quickly disappeared in the blue of the sky. In a few hours the light and powerful An-74 designed by the OKB [Experimental Design Office] imeni O.K. Antonov for flights in the Arctic will be in sun-baked Ashkhabad. There the crew, headed by V. Tkachenko, Distinguished Test Pilot of the USSR, will continue testing under the conditions of the Central Asian heat and then over the snowy peaks of the Pamirs.

"Today we took on a test flight one of the first series-produced planes which the polar aviators have been waiting for impatiently," said deputy general designer A. Bulanenko. "A second An-74 is now being tested for various failure situations which could occur in the air. At the end of this cycle of tests the plane will be given its flight certificate—the certificate of Aeroflot that it meets national airworthiness standards. Verification of the operability of the plane's systems in the heat and high altitudes of Turkmenia are necessary because the plane must operate not only in the Arctic, but also in Antarctica—and the trip there goes through all the planet's climatic zones."

The new offspring of the Antonov OKB—the An-74—displayed its wonderful flight performance characteristics last spring in evacuating the brave skiers taking part in the high-latitude expedition of *Komsomolskaya Pravda* from the ice as it was breaking up. This involved the first landing in the history of aviation of a jet plane on drift ice.

It has already become a tradition for every model in the "An" family to help to perform a task that has become urgent in the national economy. The unsurpassed capabilities of the winged super-heavyweight An-124 "Ruslan," the world's largest cargo plane, designed in Kiev, continue to arouse enthusiasm in the aviation world. It is rightly considered the height of achievements of the Antonov design office. And the reckoning point with which the office's 40-year biography began is the legendary "Annushka-2"—a real "long-liver" on the country's air routes which has carried tens of millions of passengers and hundreds of thousands of tons of cargo.

...Today they are continuing in the OKB imeni O.K. Antonov a strenuous effort on new planes. Just like the recently designed "Ruslan," the An-72, the An-74, and other planes, they will be flying even in the 21st century.

"In order to guarantee our offspring a long life in the sky," A. Bulanenko says, "the designers must be able to foresee what properties of materials, units, and systems are needed today so as to guarantee our product priority in transport aviation for years to come."

07045

**On Amendments to USSR Air Code**

*18290011c Moscow VEDOMOSTI VVERKHOVNOGO SOVETA SOYUZA SOVETSKIKH SOTSYALISTICHESKIKH RESPUBLIK in Russian No 40 (2426). 7 Oct 87 pp 719-720*

[Ukase of the Presidium of the USSR Supreme Soviet, signed in the Kremlin on 2 October, as No 7812-XI, by A. Gromyko, chairman of the Presidium of the USSR Supreme Soviet, and T. Menteshashvili, secretary of the Presidium of the USSR Supreme Soviet: "On Amendments to the USSR Air Code"]

[Text] The Presidium of the USSR Supreme Soviet hereby decrees:

To make the following amendments in the USSR Air Code adopted by ukase of the Presidium of the USSR Supreme Soviet on 11 May 1983 (*Vedomosti Verkhovnogo Soveta SSSR*, No 20, 1983, Item 303):

1) Article 9 shall read as follows:

"Article 9. State Surveillance of Assurance of Safety of Flights of Civil Aircraft

"State surveillance to see that the relevant ministries, state committees, departments, enterprises, institutions, and organizations ensure the safety of flights of aircraft, including observance of the standards of flight readiness of civil aircraft and standards of the operability of civilian airports and their equipment which are in effect in the USSR shall be conducted within the limits of its jurisdiction by the State Commission for Surveillance of the Safety of Flights of Aircraft of the USSR Council of Ministers (USSR Gosavianadzor).

"A regulation on the State Commission for Surveillance of the Safety of Flights of Aircraft of the USSR Council of Ministers shall be adopted by the USSR Council of Ministers;"

2) Point 1 of Part Two of Article 17 shall read as follows:

"1) a new design (new model) of aircraft must go through plant, state, and performance tests and receive from the State Commission for Surveillance of the Safety of Flights of Aircraft of the USSR Council of Ministers the certificate of airworthiness, if on the basis of the results of those tests it is found that this model of aircraft meets the standards of airworthiness of civil aircraft in effect in the USSR;"

3) Part Three of Article 32 shall read as follows:

"Civilian airports shall be licensed to operate according to the procedure established by the ministry, state committee, department, or organization which has jurisdiction over airports, in agreement with the State Commission for Surveillance of the Safety of Flights of Aircraft of the USSR Council of Ministers. To license an airport for operation under the meteorological minimum of Categories I, II, and III of the ICAO (International Civil Aviation Organization) the relevant ministries, state committees, departments, and organizations must obtain from the State Commission for Surveillance of the Safety of Flights of Aircraft of the USSR Council of Ministers the certificate of the airport's fitness for operation under the relevant meteorological minimum of the ICAO category if those ministries, state committees, departments, and organizations have found the airport meets the standards of fitness for operation of civil airports in effect in the USSR adjusted to take that meteorological minimum into account."

07045

**Generators for Clearing Fog From Runways  
Tested**

*18290011d Moscow IZVESTIYA in Russian 25 Oct 87 p 3*

[Interview with I. Burtsev, candidate of physical and mathematical sciences, chief of the Administration for Active Intervention of the USSR State Committee for Hydrometeorology and Environmental Control, by A. Kirillov and Yu. Kogtev]: "And the Fog Cleared..."; date and place not given]

[Text] [Question] As has already been reported in the press, special aircraft used to seed chemical reagents in the sky have played a notable role in normalizing the situation that has come about at airports near Moscow because of the dense fog. But they have also been combating this shroud on the ground: at the Sheremetyevo Airport what are referred to as nitrogen generators have gone through tests. I. Burtsev, candidate of physical and mathematical sciences, chief of the Administration for Active Intervention of the USSR State Committee for Hydrometeorology and Environmental Control, talks about what this equipment is like and why it is not being manufactured in series production.

[Answer] The nitrogen generators developed by our specialists have not yet been fully tested. But the critical situation that has come about in Moscow skies has left no time for hesitation. Six experimental prototypes were prepared for emergency operation.

To be sure, they were unable to perform their role in the first days of the "great fog." The reason is that so-called warm fogs when the temperature is above freezing both on the ground and also at a certain height, they are at present difficult to control. But on the night between 20

and 21 October the temperature at ground level dropped to -2 degrees Centigrade, but it remained above freezing at a height of about 200 meters. Under those conditions use of the generators already promised success.

The units were set up every 400 meters along runways on the windward side. They were turned on for the first time at 0635 hours on 21 October. The chilled nitrogen began to reach the ground level of the atmosphere forced from a nozzle under high pressure. Extremely small ice crystals were formed because of the cooling in the air, and they in turn served as a catalyst for further condensation of moisture. In half an hour the area of the runway was covered with a thin layer of frost, but visibility had increased from 100 to 200-300 meters.

They were turned on the second time from 0840 to 1030 hours. This time, visibility increased to 1,000-1,200 meters. That is more than enough not only to dispatch aircraft, but also to receive incoming aircraft. At the same time an An-12 arrived with a load of reagent on board, and civil aviation pilots joined specialists of the Central Aerological Laboratory of Goskomgidromet in beginning to operate against the fog from above.... It is early to say to which method of dispelling the fog we owe more, but it is still a fact that the sky over Sheremetyevo remained clear until 1500 hours.... The next day, 22 October, only the generators operated, and the result was the same."

[Question] A few words about the prehistory of the new method.

[Answer] The ground generators began to be used in our country and also in the United States and France, though to be sure, they used propane. Nitrogen units were first developed in our own country. They are now being comprehensively tested by a subdivision of the Kishinev Airport, which specializes in combating hail and fog. There is an outstanding decision to supply such generators by the end of the 5-year planning period to airports which most frequently suffer from fog: these are above all Minvody, Alma-Ata, and other cities.

[Question] What stands in the way of putting the equipment into series production?

[Answer] Probably the fact that situations like the present one do not occur so very frequently. In Moscow no one remembers such fogs as these for the last several decades. Is there any need to be surprised that our developments began to be talked about seriously only when the losses from the bad weather became quite appreciable?

Goskomgidromet does not have a production facility for series manufacture of the generators. We hope that now, after what has happened, the Ministry of Civil Aviation will show great interest in the equipment, which I am convinced has a great future....

And as a matter of fact—why was it necessary even this time to wait for a critical situation before thinking about avoiding it?... Isn't the reason why aviators have so far not shown such great interest in "weather" equipment that so far they have not been financially liable to passengers for cancellation of trips and for the inconveniences caused them?

As is well-known, foreign airlines pay a substantial penalty to passengers if a flight is postponed because of bad weather or for other reasons. In addition, they provide them free meals and lodgings. Aeroflot also bears financial liability, but only...to foreign customers.

Perhaps if aviators were forced to be concerned on the ground about those whom they have undertaken to deliver by air, they would not reject the up-to-date equipment which has long been knocking at the door?

07045

#### Reform Means Parting With Workers at Aviation Enterprise

18290011e Moscow VOZDUSHNYY TRANSPORT in Russian 4 Nov 87 p 2

[Article by M. Ilves, Pevek, Magadan Oblast: "Hopes and Doubts in the Balance"]

[Text] As of 1 January of next year the Chaunskiy Aviation Enterprise must make the conversion to the new economic conditions, which among other changes will mean fulfillment of a larger volume of work (or at least as much as previously) with a smaller staff.

By July 1988 they are to part with 330-350 workers. The potential does exist.

Here are examples. The assigned (pripisnoy) airport at Baranikha is now run by 23 people. In the most recent examination it turned out that the amount of work (one flight a day) did not correspond to its status. The decision was made to reclassify it as an MVL [local airline] field with a staff of 5-6 positions. In a large city such an action would pass by more or less painlessly, but in the remote Chukot settlement it is giving rise to rather acute social problems. As a matter of fact, where will those the collective must lay off going to go in Baranikha?

This question will be still more difficult to answer at the Shmidt Airport, where the layoffs are planned at the level of 120-150 persons. But still no other way out is to be seen. This same Shmidt, whose labor force represents a fourth of the enterprise's entire roster, handles only 15 percent of the volume of its operations. This is abnormal, and in the light of full cost accounting it seems altogether absurd. So that the cuts still have to be made. How this action is to be carried out at minimum moral cost is another question.

"The statistics show," says Aleksandr Mamedovich Ibragimov, commander of the aviation enterprise, "that the natural annual attrition of personnel in our enterprise is 100-120 persons. On that basis we decided to take this strategy on the question of the future layoffs: we release those who want to leave, but we do not take on new workers."

Thus work functions are beginning to be redistributed within every department of the Chaunskiy Aviation Enterprise. When a worker departs, the rest do his work. But this is what is happening? The additional work does not in this case mean additional pay! So, on the day when the enterprise officially makes the conversion to the new system of remuneration, wages might go up, the aviation personnel explain. But at present that is not possible. But in other aviation enterprises they are paying both for performance of additional duties and also for expanding the service zone!

In the GSM [fuel and lubricants] department, say, only 24 people are working instead of the 42 people on the organization chart. There are, of course, cases when the loss of a worker occurs without being noticed—this is a well-known fact. But, after all, that is not always the case. There are work organizations which cannot fail to be performed. And that is exactly what we are referring to here. And when it reduced its staff to almost half, the GSM department, of course, added the amount of work to those who have remained in it today. Remuneration for work must correspond to the amount of work.

In the situation described above there is also another particular circumstance which seems still more important. Here is what T. Chernaya, chief economist of the Magadan administration, has to say about it:

"In laying off people this year, we are, of course, also reducing the wage fund for this year. And for next year they are planning our wage fund at a figure which is arrived at at the end of this year. And the result is that we are deceiving people—we will not be able to increase their wages. A very serious situation could be created."

The transition to the new system has caused an ambiguous reaction in the collective of the Chaunskiy Aviation Enterprise. According to the assessments of V. Lyashchenko, secretary of the party committee, approximately two-thirds of the labor force are at present taking a passive position. This seems logical: for a long time they taught us that if a situation needs to be changed, it must be done by someone, just so we are not the ones, and then all of a sudden a vital question is put before the entire collective. This is something unfamiliar, and many people have become confused.

At the same time, according to those same assessments, all of one-third of the collective has already become convinced of the realism and inevitability of the changes and has taken an active position. People have been

making the most varied, but altogether concrete proposals aimed at improving the organization of work, at improving its quality, and at raising productivity. There is no doubt that this process will spread, and the body of those who are active will begin to grow at the expense of those who are passive. But the most important thing today is not to do something rash that would crush that belief and do damage to perestroyka.

People are very disturbed in the aviation enterprise about the upcoming planning of operations. Even today it has created a multitude of blind alleys. In the Chaunskiy enterprise, for example, 20 percent of the volume of work was planned last year, on the basis of what is called the ceiling. And this immediately affected the results of its operation. There is no way it could have been otherwise. But the volume of operations in a small region such as the one served by this enterprise is well-known, known in fact in advance, and there is nothing that could make it grow. Nevertheless, in practice its determination looks like this: last year is taken, and a few percentage points are added to its results. This system, if it continues to be applied now, could doom the entire effort. It was not for nothing that one of the managers of the enterprise told me:

"On the one hand you want to fulfill the plan. But on the other it would be very desirable to fail to fulfill it. The amounts of work are inflated. And one gets the impression that the only way to sober up the planners who send us down this kind of plan is to fail to fulfill it."

07045

#### Introducing KA-32 Helicopter to Sea Transport Use

18290011f Moscow VOZDUSHNYY TRANSPORT in Russian 4 Nov 87 p 3

[Article by Yu. Afonin, flight detachment commander, Vladivostok: "New Aircraft: We Are Running It in on the Job"]

[Text] As the helicopter carriers are put into operation, there is an acute issue as to the need to use the Ka-32 helicopter, which is able to fly in all weather, in the daytime or at night, guaranteeing the effectiveness of marine transport. And we have to work in the Ka-32 without halting flights on other types of aircraft.

No doubt about it, it is a complicated task. The principal concern here has been and still is guaranteeing flight safety. Reliance here is placed on the documents regulating flight operation: the Manual of Flight Performance, instructions, the Manual on Flight Operations, the technology for performing the various types of operations, flight personnel training programs. But...frequently they do not meet the higher requirements, and changes in them and recommendations worked out by operating enterprises themselves arrive from the State Scientific Research Institute when flights are already

being made under regular operating conditions. The absence of a scientifically sound approach is reflected in the quality of flight work. Other requirements are simply inapplicable, and other solutions are halfway measures. For example, the ministry's demand for complete radar monitoring of the flight of the helicopter during operation on maritime vessels cannot be performed by the client because industry has not been manufacturing radar sets for the vessels. And then the ministry issues permission to perform flights no more distant than the direct line of sight visibility of the maritime vessel.

An emergency landing on water and the actions of the crew called for by the instructions do not guarantee a safe outcome. After all, after landing on the water the crew of the Ka-26 helicopter cannot use a boat or a raft. The crew is in the cockpit, and the flotation devices are in the cabin, and there is a partition between them.

The Manual on Flight Operation of the Mi-8 helicopter also has not taken into account certain types of operations performed by Vladivostok aviators—loading and unloading on board ship, temperature surveys of the sea. The sailors have an increasing need for them, but the training program of flight personnel does not include even drills in operations of this kind, nor a procedure for their performance. The technology of operation and interaction of crew members have been worked out in the aviation enterprise, and, of course, they do not claim to be perfect. We expect sector science to provide scientifically sound recommendations on making up crews so as to take into account each specialist's professional abilities and personal attributes. We are awaiting solutions to real problems in organizing the stationing of the helicopter on the ship, related to regulating relations between aviators and customers, the sharing out of responsibility between them. The peculiarities of the piloting technique in performing flights from onboard ships so as to take into account its design peculiarities, wind conditions in the various stages of flight from takeoff to landing require systematization and mathematical simulation to arrive at the optimum. Recommendations are needed on the length of flights and the health standards for crews doing loading and unloading on a ship with a work cycle of 6-7 minutes. Short-leg flights require great physical and emotional efforts, and this needs to be taken into account.

The first specialized helicopter carrier, the Vitus Bering, has turned a new page in the history of transport operations in the Far East and in the Arctic. The helicopter pad and hangar are located on the vessel's stern. It can take two Ka-32 helicopters on board. The total weight of cargo being carried is 10,000 tons. The first experimental trip was performed by the Vitus Bering with the Mi-8 helicopter to the eastern shores of the Chukot Peninsula. In less than 2 months the total flight time has been 130 hours, and 2,142 tons of cargo have been carried.

From the very beginning of flights, even during a test flight, deficiencies were seen in the way the helicopter facilities were laid out. For instance, in the area where

the helicopter takes on cargo to be suspended outside, the opportunity for the helicopter to maneuver is limited by obstacles: the searchlight for illuminating the surface of the water, the mast of the dispatcher's command post, the 7-meter-high rod aerials. This has been making it difficult to work with the cargo, which may be as heavy as 3 tons when the cable is 10-15 meters long. In hovering the crew can take its orientation only from the surface of the water. Reference points located on the vessel are not visible.

The complete cycle of one flight lasts 7-8 minutes, half of that time consists of hooking on and unhooking the cargo, which is especially tiring for the crew. And that is why this decision was made: to replace the flight specialists with reserves every 3 hours. Since that time this decision has fully justified itself. And now that the unloading area has been "cleared out," all the limitations on flights over it have been removed, and the shortest possible length of the suspension cable has been established—5 meters.

We have worked out a technology for interaction between members of the helicopter crew and members of the ship's crew supporting the flights, we have drawn up a scheme for maintaining radio communication, and we have defined the actions of the crew in unforeseen (vneshtatnyy) situations.

The second trip of the Vitus Bering was to the Arctic, where it supplied produce and other necessary things to polar stations. Some 1,500 tons of cargo were carried in 75 hours of flight.

The next operation on the schedule is to deliver the "North Pole 30" polar station to the high latitudes of the central basin of the northern Arctic Ocean. And then the work with the winter personnel of Soviet Antarctic stations in the southern hemisphere, where the unloading is also done by helicopter. This trip will end next May in the home port Vladivostok.

There are plans by 1990 for the Far East Maritime Shipping Company to have five helicopter carriers in operation. The importance of such intensive introduction of the joint helicopter-marine transport system is understandable. During the short navigation season in freezing seas the turnaround time of the ships increases thanks to the speed of unloading operations. The helicopters can operate under conditions when tugboats with scows cannot go to sea because of the waves, but the Ka-32 can conduct unloading operations under weather conditions not suitable for ordinary flights. Even during an experiment helicopter unloading shortened trip time by 20 vessel-days and brought 240,000 rubles of profit, the cargo was delivered directly to the storage areas, and transshipment, required more than once, was eliminated, and that means that spoilage and damage to the goods was prevented.

The very speedy assimilation of the Ka-32 specialized helicopter will make it possible to increase the economic effectiveness of using helicopters in working with maritime vessels. That is why it is so important to quickly solve all the organizational problems of assimilating it and training and retraining flight personnel, relying on scientific developments, and to speed up the aid of sector science to production.

07045

**Dep Chief of Kamov Design Bureau on Ka-32**  
18290044a Moscow GRAZHDANSKAYA AVTATSIIA  
in Russian No 10, Oct 87 (signed to press 25 Aug 87)  
pp 21-27

[Article by V. Kasyanikov, deputy chief designer of the OKB [Experimental Design Bureau] imeni N. I. Kamov, under the rubric "New Technical Equipment of the Five-Year Plan": "Multipurpose and All- Weather..."; first three paragraphs are editorial introduction]

[Text] In order to assess the importance of the development of the Ka-32, the new all-weather helicopter for ice reconnaissance and cargo transport, at the OKB imeni N. I. Kamov under the leadership of Chief Designer and Lenin Prize winner S. V. Mikheyev, let us look at the map. The Arctic zone, which is playing a more and more substantial role in the country's national economy, covers 40 percent of the USSR's territory. Year-round navigation of the northern sea route, in which the new helicopter should provide considerable assistance, is especially important. Comprehensive operational testing of it is being conducted under different geographical conditions, in accompanying ship convoys in the Kara Sea (the helicopter has been based on the atomic icebreaker Sibir) and in providing service for the maritime drilling platforms. The technology for utilizing the helicopter in different operations is being worked out in collaboration between the OKB, the GosNII GA [State Civil Aviation Scientific Research Institute], and the Murmansk Aviation Enterprise.

The Ka-32 has been demonstrated repeatedly at international aviation exhibitions, particularly at the aerospace exhibition in France and in Spain and Poland. It has invariably attracted high interest.

Today V. Kasyanikov, deputy chief designer of the OKB imeni N. I. Kamov, tells the journal's readers about the new helicopter.

The principal objective set for the designers collective was extremely clear: to develop an aircraft capable of conducting ice reconnaissance even under conditions of the polar night and, by being based on atomic icebreakers, of helping to bring ship convoys through icefields and hummocked ice. It was clear that a helicopter of the Mi-2 class cannot carry out these unordinary requirements (it is being used to accompany ships today, but only during the day, under visual flight conditions). A

more improved, better equipped, and obviously a heavier aircraft is needed. The basic problem we had to resolve was to ensure that a helicopter could be operated safely for ice reconnaissance under the extreme Arctic conditions, day and night. So the helicopter should be provided with an advanced navigation system, radar equipment and special instruments, and deicing systems.

It must be stated, however, that the idea of operating heavy helicopters from atomic icebreakers for reconnaissance was not as obvious as it seems now. Certain doubts were associated with the difficulty of accommodating a helicopter on the deck, on a platform of limited dimensions, for example.

At the same time, developing the future helicopter with narrow specialization would have led to large expenditures for development and operation which would not have been recouped because of the low demand for such aircraft. And how would we convince seamen of the expediency of having a helicopter on board that was not equipped to carry out many different lifting and transporting operations? But we do not have to mention the importance of search and rescue operations at sea. All customers have become accustomed to considering the helicopter a multipurpose aircraft. This is correct and economically justified. Only such a situation creates additional trouble for designers and makes the design more complicated. Nevertheless, these difficulties were overcome as well. Two versions of the aircraft are undergoing operational testing—maritime and transport versions. They differ only in the number of crew members and the availability of special equipment.

The maximum endurance for the helicopter's maritime version when it is used for ice reconnaissance is 4.5 hours. The transport version of the helicopter can carry different loads of up to 5 tons suspended externally and up to 4 tons inside the fuselage. The maximum range with the main fuel tanks filled is 850 kilometers with a payload of 1.6 tons (or 16 persons). The range with a 3-ton load is 300 kilometers. The cruising speed is 220 to 230 kilometers per hour.

The operational testing was preceded by extensive work to refine the helicopter and establish its planned performance, as well as experiments to broaden the scope of its application. Thus, it successfully carried out ice reconnaissance from the atomic icebreaker Sibir, unloaded a supply ship on a shore without facilities under northern navigation conditions, took stacks of valuable timber out from the mountainous felling areas in the Northern Caucasus, and performed many other complex operations. The Ka-32 also was utilized at Chernobyl, taking part in coping with the aftereffects of the accident. The performance and high level of technical refinement and efficiency in providing service for sectors of the national economy that were planned were confirmed in the testing process.

Sportswomen T. Zuyeva and N. Yeremina set world records for rate of climb and altitude in the Ka-32: a maximum altitude of 8,250 meters without a payload and 6,400 meters with a 2-ton payload, and 4 minutes 46.5 seconds to reach an altitude of 6,000 meters. These are indicators of the helicopter's high capabilities. It is interesting that its rate of climb proved to be comparable with that of airplanes! As an example, the Yak-3 and La-5 fighters reached altitudes of 5,000 meters in 4.5 and 4.7 minutes, respectively.

### The Design

As with all the aircraft developed by our collective, the Ka-32 has a coaxial layout; owing to its characteristics, we succeeded in building a very compact aircraft. With the capability of lifting 5 tons suspended externally it occupies less space on an icebreaker's platform than the Mi-2, which has one-fifth the capacity.

One of the principal tasks for designers in creating a helicopter is the problem of developing a rotor system of minimum mass which possesses the necessary service life and reliability. This problem was intensified further with the Ka-32 because the requirement to reduce its dimensions in every possible way led to an increase in the specific loading of the main rotor up to 60 kilograms per square meter. Thus the Ka-32 is the only helicopter in its weight category today which has such a high specific loading. And at the same time, under the conditions for which it utilized, it has to fly for long periods of time at low speeds, which for a helicopter is always characterized by a higher level of vibration, leading to increased loads and as a result, a shorter service life.

The helicopter's coaxial layout has an advantage over other arrangements in this respect. And experience in operating the Ka-26 and Ka-25K helicopters attests to this. In addition, a vibration damping system is used on the Ka-32 to reduce the level of vibrations, taking into account the fact that it was designed for a wide range of speeds and long periods in the air. It consists of weights installed at the root of the lower blade and adjusted in such a way that their vibrations are in opposite phase to those of the blade. This design solution made it possible to reduce vibrations to a comfortable level throughout the range of flight speeds.

The Ka-32's rotor system is similar in design to that of the Ka-26, with the classic three-hinge arrangement. The OKB's wide experience was utilized extensively in developing it. The hubs and wobble plates are made of highly durable materials, and the blades are made entirely of fiber glass with fibers that are stronger. They are equipped with an electric deicing system. All the units and components in the rotor system have undergone extensive bench testing to ensure that they have the required service life and reliability indicators under all flight conditions.

The Ka-32's folding blades are a distinguishing feature of its rotor system. They are secured to the tail boom in the folded position. The helicopter's dimensions are drastically reduced in the process, which is very important both for positioning it on a ship's deck as well as storing it in a hangar. Those who operate it on land will also like this innovation: it simplifies towing and organization of the parking area.

The helicopter's fuselage is traditional in design, made basically of aluminum alloys. It has three doors, two of which are on each side of the forward section, and the third—the cargo door—on the left side of the fuselage tail section. There are 16 folding seats along the sides of the cargo cabin, which is separated by a bulkhead from the cockpit. There are tie-down points to secure cargo on the floor. The external suspension system is installed on a truss in the cargo cabin. Fuel tanks have been installed underneath the cargo cabin floor.

A winch unit with a swiveling arm capable of lifting 300 kilograms has been installed over the cargo door for rescue and evacuation operations in the hover mode.

The helicopter's tail assembly consists of a stabilizer and two endplate fins and rudders positioned at the ends of the stabilizer. The fins are canted inward at a small angle to the line of flight. This fin arrangement makes it possible to improve the helicopter's directional stability. Composite materials were used extensively in constructing the stabilizer and fins; the ribs and skin of the fins and rudders are made of them.

The helicopter has fixed four-wheel landing gear of the pyramid-parallelogram type with double-chamber shock absorbers of high and low pressure. The shock absorbers of the main landing gear provide for minimum displacement force which increases slowly at the beginning of compression. This makes it possible to cushion the shocks at the moment of impact (especially in landings on a rolling deck) and has a favorable effect on increasing the reserves for "ground resonance." Landing gear of similar design on the Ka-25K helicopter has proved itself under adverse operating conditions.

For landings on water, the Ka-32 has been provided with emergency inflatable balloonets which are arranged along the sides of the fuselage and secured to it on special frames. When they are not in use, the balloonets are rolled up and covered with flaps; in an emergency situation, they are filled with air from a special pneumatic system and the flaps are jettisoned. This system is similar to the one on the Ka-26, but the balloonets there are positioned on the landing gear. Arranging them on the fuselage makes it possible to reduce parasitic drag and lessen the likelihood of damage during operation. The balloonet is filled by remote control from a button on the collective-pitch control.

### The Power Plant

The helicopter has two gas turbine engines with a TVZ-117 free turbine designed by S. Izotov, each with takeoff power of 2,225 horsepower. The engines are started with an air-driven turbine starter: the compressed air for it comes from the on-board auxiliary power plant or from a ground unit. A control system provides for automatic starting, as well as for steady operation in all the regimes established for the allowable speeds of the turbocompressor and the free turbine. The engines' power setting is monitored with the aid of a special instrument—an indicator of engine conditions installed on the pilot's instrument panel. It automatically indicates the power settings under different flight conditions—at different altitudes and temperatures.

Manual control of the engines has been provided in the event that the automatic system fails. The manual control system ensures that the engines' power setting is maintained, both when one of them is in the automatic mode and when both are controlled manually.

Torque is transmitted from the engines to the two main rotors and the helicopter accessory drives with the aid of a reduction gearbox. The gearbox has two overriding clutches which automatically disengage the gearbox from the engines to enable the helicopter to fly with one engine, as well as in autorotation.

The engines are mounted on the fuselage in front of the gearbox. Practically all the systems which support the operation of the engines and gearbox—for fan and oil cooling, starting from the auxiliary power plant, fire suppression, and so forth are located behind the gearbox in a compartment of the engines' nacelle.

### The Basic Systems

The helicopter's control system is the customary single system used on all helicopters with a coaxial layout. It includes a stick for cyclic pitch, a collective-pitch control lever, and pedals.

Dual controls can be installed in the helicopter for training purposes. The helicopter may be operated from either the left or the right seat with dual controls.

When the stick is deflected longitudinally or laterally, the wobble plates of the upper and lower rotors are inclined accordingly, and by changing the angle of the blades, the pitch of the rotors' thrust is changed, which leads to a change in the helicopter's attitude: it goes into a pitch, pitches up, or banks. When the pedals are deflected, the pitch of the main rotors is changed, increasing on one and decreasing on the other. This leads to unequal torque, and consequently, a reaction torque, which turns the aircraft either left or right. When the pedals are deflected, the rudders are deflected at the same time.

When the collective-pitch control lever is moved, the angle of all the blades is changed (increased or decreased) at the same time and to the same degree, which increases or decreases the rotors' thrust. This makes the helicopter climb or descend.

Collective-pitch control through an integrating-differential mechanism is connected with control of the engines. For this reason, a change in collective pitch (rotor thrust) brings about a corresponding change in engine power when they are maintained at constant speed.

A distinguishing feature of the Ka-32 control system is the unification of the four controls (irreversible hydraulic power units) into a single unit, which is located between the engines in front of the main rotor shaft, and the use of 20 percent of the motion of the controls for operation of the system for automatic stabilization and control of the helicopter.

Trim mechanisms are included in a kinematic circuit of the system for removing or reducing forces on the controls, as well as to balance the controls in any deflected position.

The helicopter's hydraulic system consists of three self-contained systems—the basic, backup, and auxiliary systems. The basic system is for the control surface actuators (servos) in the helicopter's flight control system, the brake assemblies, and the hydraulic cylinder for the winch arm. The backup system automatically comes into operation when the basic hydraulic system fails, but it powers only the control surface servos. The sources of pressure for the basic and backup systems are hydraulic pumps installed on the gearbox for the main rotors. The auxiliary system is intended for actuating the hydraulic mechanisms of different systems in the helicopter; the power source for it is a pumping station. In addition, the pumping station may be connected to the basic hydraulic system to supply all its users.

The helicopter's fuel system consists of 10 fuel tanks, combined in left and right groups, with a total volume of 3,450 liters. Eight tanks are located under the floor of the cargo cabin and two tanks are on the outside, along the sides of the fuselage in containers. The two tanks are easily removed, and are taken down in the event that an external suspension unit is installed. Each group of tanks has a feed tank, where the fuel comes from the other tanks. However, the fuel distribution system makes provision when necessary for supplying each engine from either group of tanks, as well as for supplying both engines from one group.

Immersed tank pumps are used for pumping fuel from one tank to another, as well as for supplying the engines. They are switched manually before the engines are started. The pumps for transferring fuel are turned off automatically after all the fuel is out of the tank. In order to avoid cutoff of the transferring pumps prematurely, which may result from a fuel discharge when the helicopter maneuvers, there is a timer in the pump control circuit which delays the cutoff for an

assigned period of time which is longer than the time necessary for any maneuver. Two pumps working in parallel are installed in the feed tanks of each group to increase the reliability of the fuel system. In addition, the engines' fuel pumps are able to supply fuel from the feed tanks through a no-return bypass valve when both pumps in the feed tanks fail.

In case of failure of the basic electrical system, the pumps are connected to the essential busbar for the power supply.

The helicopter is fueled through fillers or a centralized pressure refueling point. Centralized refueling is controlled from a panel situated on the left side of the fuselage's tail section.

Flights in instrument weather conditions, especially in the high latitudes over the Arctic Ocean, are often conducted under icing conditions. The designers devoted considerable attention to measures to prevent this dangerous situation. The helicopter has extremely effective deicing systems for the engines' air intakes, the cabin windows, the pitot tubes and clocks, as well as the main rotor blades. The air intakes are heated by hot air drawn from the engine compressor, and the pitot tubes and clocks are heated from the on-board electrical network. Fogging and icing of the cabin windows is prevented by a flow of hot air from the manifolds of the heating and ventilation system and washing with an alcoholic mixture.

The main rotor blades are heated electrically. The heat is turned on manually or at a signal from the radioisotope ice detection indicator. Heating elements are mounted in

the leading edges of the blades. They are powered by the network of three-phase alternating current. The deicing system for the blades is intended for operation continuously throughout an entire flight.

A three-phase alternating current system is the basic power supply system. Electric power comes from two generators installed on the reduction gearbox for the main rotors. The generators can operate individually or in parallel. When one generator fails, the other will provide power for all purposes. When both generators fail, the power supply for the vitally important users connected to the essential busbar is automatically switched over to the on-board storage batteries.

Hot air taken from the engine compressor is mixed with the outside air and fed into the cabin in order to establish the necessary temperature conditions. Ventilation is provided by air inlet.

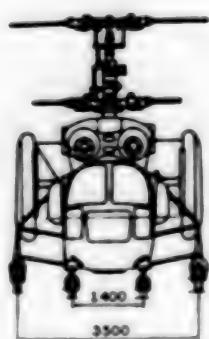
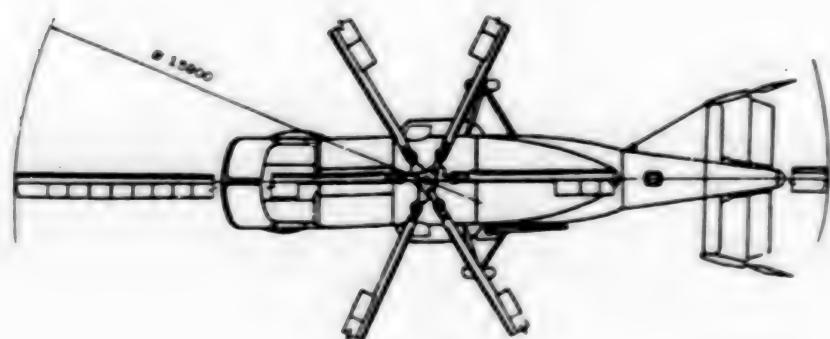
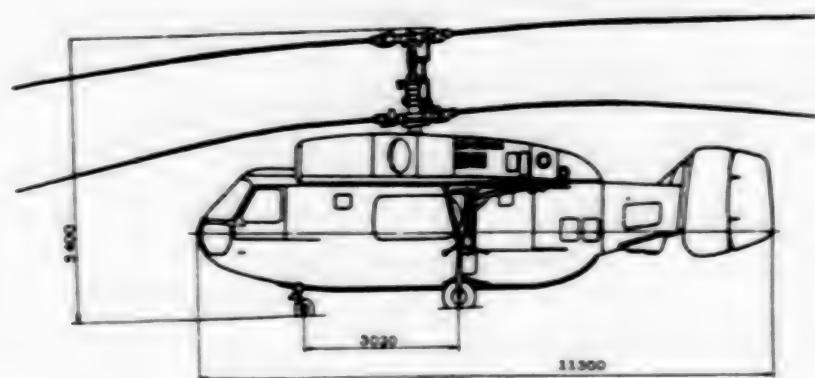
The helicopter's on-board radio equipment includes a computer. This unit programs the route for a flight in advance, and it may be corrected by the pilot in any stage. After arrival at an assigned point, it provides for an automatic approach with high accuracy.

The design of the Ka-32 and the layout of its equipment, as well as its self-contained power supply, make it possible to perform technical maintenance without special accessories and units—and a large number of specialists as well.

The advanced technical and economic features, including fuel economy, all-weather use, and simplicity of maintenance—these are the basic advantages of the Ka-32 helicopter.

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### ЛЕТНО-ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ ВЕРТОЛЕТА Ка-32

Нормальная взлетная масса, тонн . . . . .	11
Максимальная полетная масса с грузом на внешней подвеске, тонн . . . . .	12,6
Масса груза внутри кабины, тонн . . . . .	up to 4
Масса груза на внешней подвеске, тонн . . . . .	up to 5
Максимальная скорость полета, километров в час . . . . .	210
Крейсерская скорость полета, километров в час . . . . .	230
Максимальная дальность полета, километров . . . . .	850
Максимальная продолжительность полета, часы . . . . .	4,5
Практический потолок с нормальной взлетной массой, километры . . . . .	5

#### Performance Specifications of the Ka-32 Helicopter

Standard takeoff mass, in tons	11
Maximum in-flight mass with cargo suspended externally, in tons	12.6
Mass of cargo in cabin, in tons	up to 4
Mass of cargo suspended externally, in tons	up to 5
Maximum flight speed, in kilometers per hour	250
Cruising speed, in kilometers per hour	230
Maximum range, in kilometers	850
Maximum flight endurance, in hours	4.5
Service ceiling with standard takeoff mass, in kilometers	5

**Murmansk Workers Comment on Ka-32**  
18290044b Moscow GRAZHDANSKAYA AVIATSIYA  
in Russian No 10, Oct 87 (signed to press 25 Aug 87)  
p 26

[Comments by Murmansk Aviation Enterprise employees on the Ka-32 helicopter under the "New Technical Equipment of the Five-Year Plan" rubric: "Aviators Give Their Appraisal"]

[Text]

**V. Sigov, flight collective commander:**

This aircraft is unusual. With its small dimensions, it has high payload capacity and engines with a large power reserve. Our crews are familiarizing themselves with the aircraft successfully. Their unanimous opinion is that the helicopter is convenient. The advanced on-board equipment makes it possible to take off when the visibility is nearly zero—we could not do that before. There is more directional stability with the coaxial arrangement used in the helicopter's design (unlike the single-rotor layout), and it is affected less by crosswinds. The Ka-32 has performed well with an externally suspended load.

However, the new aircraft is quite complicated, all the same, and it is no secret that it is a little expensive; under the conditions of full cost accounting and self-financing, this is a fact of at all (the cabin is just 1.3 meters high, and the seating is small and uncomfortable). So carrying passengers is difficult. This reduces the aircraft's operational advantages, since under conditions in the North, as a rule, we have to combine cargo and passenger transportation—let us assume we carry cargo to a drilling site and persons on the return trip, for example.

**V. Kovalev, senior engineer, PANKh [Use of Aircraft in the National Economy Administration]:**

The Ka-32 helicopter is simply irreplaceable for basing on the deck of a seagoing vessel. On land it is basically a helicopter crane, designed for transporting cargoes suspended externally. Moreover, it is not convenient as an installing crane: the pilot's field of view below has not been provided for, and the vortex from the rotors is too strong. It is very difficult to accommodate cargo in the cabin—especially the lengths which are typical for us—and there aren't even any cargo doors.

On the other hand, the power reserve of the engines is simply staggering. Our pilots saw a "takeoff regime" on the instruments only one time—when they lifted a multiton ZIL-157. But with ordinary cargoes they usually take off under nominal rating conditions.

If we are speaking about design shortcomings, the range is rather poor, especially on flights with a load suspended externally: indeed, we have to remove the external fuel

tanks then. Incidentally, we have already sent the aircraft's developers our suggestions on improving the design of the tanks and the external suspension installation.

**R. Banyashkin, chief engineer, Aircraft Maintenance Base:**

The helicopter has been adapted quite well for maintenance. But I will mention individual aspects of unfinished work. For example, it is inconvenient to drain fuel from the lower points. Certain maintenance features of the new helicopter have required that the usual concepts and established traditions be reexamined. In particular, new rules on periodic maintenance have been established which differ substantially from previous procedures. In a word, the new aircraft requires a new approach. We have to restructure our work methods.

**B. Baskakov, chief of the Economic Planning Department:**

The distinguishing feature of the Ka-32 helicopter is that it does not take the place of some similar but less advanced aircraft; fundamentally new features have been incorporated in it. It is designed to perform operations which either were not performed at all before or which were carried out on a different level. Take even the flights to drilling rigs on the continental shelf: previous helicopters could not fly over the sea. Or, as an example, ice reconnaissance from the decks of icebreakers, combined with the unloading of vessels on a shore without docking and unloading facilities—all these things are not only additional production volumes but types of work that are qualitatively new. For this reason, inclusion of the Ka-32 is an important step forward for our aviation enterprise in the development of scientific and technical progress and the assimilation of new capacities.

Clear and unequivocal answers have not been provided yet to questions on organizing efficient operation of the helicopter. The financing and the involvement of additional personnel are not entirely clear. But I believe been called upon to play an important role in providing additional aviation services and in the socioeconomic development of the Soviet Arctic.

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**Possible Fuel Economies from Ground Support Vehicles**

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in Russian No 10, Oct 87 (signed to press 25 Aug 87)  
pp 30-31

[Article by V. Gorbachev, deputy chief of the UNS MGA [Ground Structures Administration of the Ministry of Civil Aviation], and V. Shmagin, staff scientist of the GPIiNII "Aeroprojekt" ["Aeroprojekt" State Planning and Surveying and Scientific Research Institute], under the "For Economy and Thrift" rubric: "What the Fuel Gauge Has Shown"]

[Text] With the current volume of operations in civil aviation to service aircraft and keep airfields operational, ground support equipment consumes a considerable amount of fuel: about 170,000 tons annually. Experience shows, however, that there are considerable reserves for economizing it.

The most important one is improvement in a vehicle's technical condition. Research has shown that bad repair and incorrect adjustment of individual components (even those which are not directly related to fuel, at first glance) can lead to excessive consumption. It is common knowledge, for example, that reducing the valve clearance in the ZiL engine by just 0.1 millimeter changes the phases of gas distribution, resulting in a loss of 3.5 to 4 percent in engine power and increasing fuel consumption by 2 to 3 percent. Incorrect adjustment of the engine's cooling system leads to fuel consumption that is up to 10 percent higher, a faulty brake system leads to fuel consumption that is up to 15 percent higher, and faulty ignition consumes up to 15 to 20 percent more fuel. The stability and handling of a vehicle are the most important indicators which affect economy of operation. Thus, an increase in wheel toe-in up to 6 millimeters (the standard is 2) leads to up to 15 percent more fuel consumption. Tire pressure has a definite effect: reducing it by 20 percent leads to an increase of 5 percent in fuel consumption.

It is especially important to single out the fuel system's technical condition. Research conducted by the RSFSR Ministry of Motor Transport has shown that up to three-fourths of the vehicles with carbureted engines have an incorrectly adjusted idle stroke and almost half are being operated with a higher level of fuel in the float chamber and with faulty economizer systems.

Careful preparation and adjustment of fuel equipment is especially important for the normal operation of diesel engines. Even when new diesel engines have low operating time, the cyclical feed of fuel is changed as the result of the deterioration of piston pairs, which leads to increased fuel consumption at the same time. According to different estimates, fuel economy of up to 20 percent can be achieved by maintaining the best parameters for the fuel system.

Improvement in the technical condition of machines and mechanisms can be achieved in most cases by timely and high-quality maintenance, using modern technology, particularly diagnostic equipment. It should be mentioned that technical diagnostics is increasingly becoming a factor in providing for fuel economy. For this reason, special attention should be devoted to providing aviation enterprises' specialized vehicle services with diagnostic equipment.

While the effect of technical malfunctions on fuel consumption has been studied in considerable detail, the relationship to it of operating conditions and the details of organizing transportation has not been analyzed sufficiently.

Efficient utilization of transport vehicles to carry freight deserves attention. And there are quite a few cases of mismanagement here. Many runs are made without loads. Loading is inefficient. A 5-ton vehicle sometimes carries 200 to 300 kilograms. Analysis has enabled us to establish that the average coefficient is 0.4 for use of vehicle capacity and 0.54 for the number of runs in aviation enterprises. A similar situation is repeated year after year. An efficient system of route distances should be worked out in each specialized vehicle service, but in most cases the drivers of the vehicles choose their route of travel independently.

Day-to-day monitoring of efficiency in the use of fuel by each vehicle, machine and mechanism consists of a comparison of the rate of consumption with the actual volume used. Data on the model of the rolling stock, the number of runs and time accrued in a shift for transporting work, and the amount of fuel given out before vehicles depart and the amount in the tank when they return are necessary for this. Calculation is begun by establishing the fuel "left over" in the tank according to the trip logs and by determining the amount of GSM [fuel and lubricants] actually consumed. However, the reliability of information under the existing system of calculation raises justifiable doubts. It is impossible to accurately determine the amount left in the tank. As a rule, it is established in accordance with what the driver says. Occasionally it is estimated roughly with the aid of measuring rules. In practice both here and abroad, generally, all the instruments record the level of a fluid in one way or another, and it is later recalculated in volume. But the actual volumes of fuel tanks on even the same vehicle models may vary by several liters (because of allowances in their manufacture and deformations in the process of operation) and the volumes for different vehicle models may differ by several dozen liters! Calibration of the instruments for each specific vehicle is necessary for this reason. Clearly, it is difficult to perform this work in all aviation enterprises. Obviously there should be different principles for measuring fuel consumption.

The necessary accuracy in measurements should be ensured by making readings independent of the accuracy with which machine elements are manufactured. The ways of resolving this problem are clear, and one of the enterprises of the Ministry of the Automotive Industry is organizing series production of flow meters which are designed for installation in the fuel systems of carbureted and diesel engines. These instruments will be installed both in new vehicles and those now in use.

A more accurate record of the work performed during which a certain amount of fuel and lubricants is consumed is necessary as well. What do we have at our disposal now? In principle, a record of the operating time of specialized vehicles is made on the basis of readings from a vehicle speedometer or the device to measure engine hours installed on tractor and specialized chassis. But after all, we must also take into account the running

time of the engines of operating equipment which the overwhelming majority of airfield vehicles have. However, the necessary instruments have been installed on only a limited number of them. Specialized vehicles have been equipped with hour meters over the past 2 or 3 years. They are general-purpose, have the necessary accuracy, and are compact and convenient. Unfortunately, they also have a very important drawback: these instruments are actually electric clocks which are "indifferent" to the power setting of the engine (or other unit) to whose electrical system they are connected. But fuel consumption depends primarily on the engine setting. Research conducted at the "Aeroprojekt" State Planning and Surveying and Scientific Research Institute showed the conceptual feasibility of making instruments which record engines' operating time differentially. It is important to organize their development and manufacture at specialized enterprises.

At the same time, the often unsatisfactory technical condition of instrumentation in services must be mentioned. There are several reasons. First of all, there is still no real economic incentive to save fuel or responsibility for its excessive consumption. Secondly, practically no repair base for instruments can be found and the supply of spare parts is unsatisfactory. Finally, metrological inspection has not been organized efficiently enough. Obviously, the problems require centralized solution.

As already stated, day-to-day monitoring of efficiency in fuel use means correlating actual consumption with the rates of consumption. Norm setting is one of the key problems in planning, calculating and monitoring the consumption of physical resources. At the same time, it is assumed that the norms should be objective and developed by taking into account the latest achievements of science and engineering, advanced experience, and the details of operation. The norms should also be progressive and provide incentive for economizing resources.

A number of normative documents which regulate the specific consumption of fuels and lubricants for individual models and versions of vehicles per unit of work produced are in force now in civil aviation. In addition, experience has shown the necessity for a document to regulate fuel consumption in relation to the intensiveness of airport operations, that is, aircraft departures. This is necessary for planning purposes, first of all. Such a normative document—"Provisional specific norms for the consumption of fuels and lubricants to support one aircraft departure by types of aircraft"—has now been drafted. The norms were distributed to all administrations for approval during 1987. In the future, after thorough analysis, the necessary amendments will be made and permanent norms will be worked out for all classes of airports and all types of aircraft.

In setting norms, attention must be devoted to the application of winter increases to the specific fuel consumption norms. The provision in force here is being

violated by practically all aviation enterprises. The issuance of an appropriate order by the local ispolkom should precede introduction or abolition of the increase. Further, the increases are often adopted without taking into account the actual climatic conditions. At the same time, there has been favorable experience in using the system of differentiated increases developed in Tyumen: the entire range of temperatures during winter is broken down into ranges of 5 degrees, and a coefficient of increased fuel consumption is established for each range. Introduction of this system has made it possible to reduce fuel consumption by 4 to 6 percent without additional physical inputs.

As with other fields, economy is influenced significantly by the human factor. Aspects of the driver's character are of considerable importance: his emotional and physical condition, his carefulness and skill, and habits of economical driving under specific road and operating conditions. Unfortunately, instruction in efficient methods of economical driving is not in common practice in motor transport. Questions relating to the human factor should be the main ones in everyday work not only for command and supervisory personnel, but for party and trade union organizations as well. These are concern for the quality of production and the moral and psychological atmosphere in the collective, continuous technical training and increased vocational skill, improvement of the forms and methods of socialist competition for economy and thrift, the holding of monthly campaigns to economize fuel and lubricants, and the like. All kinds of contests must be more widely popularized for drivers to demonstrate their knowledge and driving skill.

Unfortunately, a type of incentive such as material reward for efficient use of vehicle fuel has not been applied in practice extensively in the sector. But after all, there is a special decree of the CPSU Central Committee and the USSR Council of Ministers on this account.

The availability of filling stations, parking places, and so forth are of considerable significance in economizing fuel. The advantage of one's own refueling facility is obvious: unproductive runs and transport operating time and additional supervision are ruled out. More than 40 stationary vehicle filling stations are now in operation at aviation enterprises. They are being planned for introduction at all major airports in the future; the others will make use of mobile stations.

The highest demand for vehicle fuel is during the winter. Hence, there should be more attention devoted to the maintenance of transport facilities in this period. The number of parking places that are sheltered or heated (with steam or hot air) is clearly inadequate: more than half the fleet of ground support equipment is kept in open areas, and vehicles' engines sometimes are not turned off around the clock. While construction of sheltered parking areas is an expensive measure, organization of preheating before starting is completely within reach and, as experience shows, extremely effective. The

experience of airports such as Borispol, Omsk, Tomsk, Saratov, Sverdlovsk, Yuzhno-Sakhalinsk, Surgut, Vladivostok, and others attests to this.

Fuel and power resource economy is inseparable from the use of nontraditional or, as they are also called, alternative fuels. As in other sectors of the national economy, work related to the use of alternative vehicle fuel is under way in civil aviation. A savings of 2,400 tons of gasoline by introducing vehicles powered by bottle gas has been planned for the 12th Five-Year Plan. Several hundred such vehicles should be in operation by 1990. For the present, their use is strictly limited, and allowed only to carry household goods, without going out on the apron. Research is now being conducted on the feasibility of using vehicles powered by bottle gas for maintenance and commercial servicing of aircraft.

The quality of fuel has a substantial effect on economical engine operation. For example, an increase of 10 units in the octane of gasoline makes it possible to increase the degree of combustion and the extent to which cylinders are filled, to increase engine power, and to reduce specific fuel consumption by approximately 5 to 8 percent. The use of gasoline with lower octane leads to intensive cylinder and piston wear, reduced engine power and increased fuel consumption. Deviation from the quality indicators for sulfur, tars, and aromatic and unsaturated hydrocarbons contributes to the formation of deposits and deterioration in engines, increasing fuel consumption by 5 to 10 percent. The same disadvantages apply when a mixture of gasoline with different octanes is used frequently.

Use of an antiknock compound has considerable effect on fuel consumption. Substituting tetraethyl lead for tetramethyl lead will make it possible to improve engine fuel economy by 4 percent. Finally, the fractional composition of fuel plays an important role. The use of gasoline with low saturated vapor pressure during the winter increases consumption with the long engine warmups, and the formation of vapor locks in the fuel system is possible during the summer.

The cetane rating, viscosity, density and fractional composition affect the efficiency of diesel engines. A decrease in the fuel's cetane rating leads to rough engine operation because of the increased delay in ignition. For this reason, all marketable diesel fuels used in motor vehicles are produced with a cetane rating of no less than 45. Use of fuel with a cetane rating of more than 50 leads to increased consumption as the result of incomplete combustion.

**Increasing the viscosity and density of diesel fuel leads to impaired atomization by the injector and evaporation during the time that combustion is delayed, deterioration of the process of forming an air-fuel mixture, and a decrease in the engine's economy. However, reducing the fuel's viscosity excessively also has a harmful effect on development of the mixture formation process because of**

**the reduced length of the fuel spray in the combustion chamber. In addition, excessive reduction of viscosity in diesel fuel leads to intensive wear in fuel equipment, particularly the piston pairs. Lightening the fractional composition of diesel fuel, which is often encountered in practice, by diluting it with kerosene or gasoline, leads to rough diesel operation; moreover, it makes starting and warmup difficult because of the increased heat in evaporation of the combustible mixture, reduction of temperature in the combustion chamber, and increased delay in combustion. As a result, fuel consumption is increased, especially when there is a prolonged warmup under low temperature conditions. Economical diesel engine operation also has a direct relationship to the tendency of the fuel to form deposits in the combustion chamber and especially on injector components.**

All fuel quality indicators are strictly regulated. It is only necessary to monitor them carefully. This is the task of aviation enterprises' fuel and lubricants services, which have highly skilled specialists and the necessary equipment.

In speaking of economizing fuel resources, we cannot help but dwell on the problem of the technical level of mechanized facilities. It must be stated frankly that this level, with rare exceptions, is lower than what is desired. Take the struggle against glaze ice on airfield surfaces. Heating machines equipped with aircraft engines that have completed their service life are in wide use at present. In this case, the fuel energy utilization factor is only 10 to 12 percent. But after all, roughly 30,000 to 35,000 tons of aviation kerosene is consumed annually for this throughout Aeroflot

The search for more efficient means of coping with icing has led to the development of a machine with an infrared source. This has made it possible to increase the efficiency factor of fuel energy up to 50 to 55 percent. Initially 16 models of the machines were manufactured and sent to different airports. What has experience in using them showed? When the machine works, it produces precisely the result desired. The problem is that it very seldom works: something is sure to be defective. It has been learned that the basic reason is the utterly irresponsible attitude of the manufacturer (Plant No 31). In spite of all sorts of inquiries, the plant is not trying to take any steps. Moreover, the machine was taken out of production altogether in 1987.

Even a brief analysis of the ways for mechanized ground facilities in aviation enterprises to economize fuel demonstrates that they are related primarily to improvement in work organization and the technical condition of rolling stock, improvement in norm setting, reinforced monitoring of petroleum product consumption, and moral and economic incentive for workers to economize fuel, as well as improvement in the structural features of equipment based on the latest achievements.

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## Il-76TD Configured to Service Antarctic Installations

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[Article by M. Chistyakov, leading engineer, GUZSANT MGA [Air and Ground Production Equipment Orders Main Administration, Ministry of Civil Aviation] under the rubric "With the Course of Scientific and Technical Progress": "The Il-76: A Million Tons to Its Credit"; first two paragraphs are editorial introduction]

[Text] The first Il-76 aircraft, which is today the flagship of cargo aircraft in civil aviation, made its appearance on Aeroflot routes in October 1977.

The aircraft, which was built by the collectives of designers, scientists, engineers and workers of the renowned OKB [Experimental Design Bureau] imeni S. V. Ilyushin, the Tashkent Aviation Production Association imeni V. P. Chkalov, and other industrial enterprises, is designed to carry freight in standard containers and on pallets, as well as large-sized and long items.

The Il-76 meets the high demands for flight safety and reliability of operation set for aviation equipment. It can be operated under any conditions: in the intense cold of the Arctic and in the heat of the tropics, using paved and unpaved runways.

The advisability of developing an aircraft of this type for civil aviation was dictated primarily by the intensive growth of air cargo transportation in the late 1960's and early 1970's and the need to deliver heavy and large-sized loads to the remote regions under development in the Far North, Siberia and the Far East, and the oil and gas complexes in Tyumen Oblast in particular. The designers had to resolve a number of complicated technical problems associated with the need to operate the Il-76 from unpaved runways of limited dimensions, that is, the need for short takeoff runs and rollouts and low speeds for approaches and takeoffs. A number of new engineering solutions in the aerodynamic configuration of the wing, the multiple-wheel landing gear of increased capacity with a highly efficient brake system for the main gear, and the high degree of mechanization for cargo handling operations have made it possible to develop an aircraft which compares favorably with foreign models.

The aerodynamic configuration of the Il-76 was selected on the basis of the requirement to provide for delivery of loads with a mass of 30 to 35 tons over an operational range of up to 5,000 kilometers at a cruising speed of 750 to 800 kilometers per hour.

The Il-76 has a crew of seven: the aircraft commander, copilot, navigator, flight engineer, radio operator, senior cargo handler, and cargo handler.

The aircraft is a cantilever monoplane with a high sweptback wing, a single-fin sweptback T-tail, and a five-strut undercarriage. The power plant consists of four D-30KP bypass turbojet engines, each of which develops 12 tons of thrust, mounted under the wing on vertical pylons. The relatively large power-to-weight ratio, efficient high-lift devices—triple-slotted full-span extension flaps, braking flaps and lift dampers (spoilers), thrust reversing on rollout, and the reliable braking system ensure good airfield performance for the aircraft. A TA-6A auxiliary power plant, located in the left housing of the main landing gear, makes it possible to provide pneumatic starting for the engines, power for the conditioning system on the ground, and power for the on-board AC and DC power network.

The control system for operating the control surfaces is nonreversible, with power for servos provided by two independent hydraulic systems. Manual control is possible concurrently with use of the servos.

A high level of flight safety is ensured for the Il-76 by redundancy of systems (with automatic cutoff of those that have failed), the use of four engines (the failure of one does not create a handling problem), and flight control, navigation, and avionics equipment which enable it to be flown under instrument weather conditions.

The complex of cargo-handling facilities has made it possible to improve transport efficiency, especially when the aircraft is operating at airfields without ground facilities or machinery. Two electric winches and four electric hoists provide for independent operation and maneuverability and make it possible to significantly extend the range of products handled. In addition, the use of standardized aircraft containers (UAK-2.5 and UAK-5) and pallets (PA-2.5 and PA-5.6) has led to a significant reduction in the time devoted to cargo handling, which is especially important in the cold temperatures of the North and Siberia.

During the aircraft's operational testing conducted in the severe climate of Western Siberia, intensive cargo shipments were made to fill the needs of the oil and gas workers at Nadym and Nizhnevartovsk. Tractors and pipe layers, different types of vehicles, excavators, buses, drilling machinery, diesel power plants and transformers, pipe and rolled stock, machine tools, and other equipment were delivered to these areas. The average time spent in the tests for one flight on the Tyumen-Nizhnevartovsk-Tyumen route, 1,570 kilometers, with a load of up to 35 tons was 3.5 to 4.5 hours. The tests demonstrated the aircraft's considerable transport capabilities and confirmed the correctness of the design solutions incorporated in it.

The Il-76T, a modified version of the Il-76, also went into service in 1977. It has a higher takeoff and landing mass for both paved and unpaved runways. The payload mass was increased up to 40 tons, the landing mass up to

151.5 tons, and the fuel mass by 18 tons. The cargo cabin of the Il-76T is equipped with on-board facilities for cargo handling and tiedowns for aircraft containers and pallets, the airframe was reinforced, and changes were made in the floor construction. In addition, the composition of the Il-76T's avionics, emergency-rescue, and general equipment is different.

The production cost per ton-kilometer for the Il-76T is 7.1 kopecks, which is 22.4 percent less than for the Il-76. Compared with the An-12 aircraft, it is economically more expedient for the Il-76T to transport cargoes for distances over 1,650 kilometers. Moreover, its special multiple-wheel landing gear enables the Il-76T to use a significantly larger number of unpaved airfields.

With the addition of the Il-76T to its fleet, Aeroflot was able to transport cargoes to the most remote areas. Its flights initially were involved with development of the wide expanses of Western and Eastern Siberia, the Far North and Chukotka, Yakutia and the Arctic region. But in 1978, the Il-76T began regular flights on international routes: to Luxembourg, Prague, Plovdiv, Hanoi, Delhi, Kabul, and a number of other foreign cities.

In the process of subsequent work, the designers were set the task of increasing the range and carrying capacity of the aircraft at the same time. With this objective, as well as to provide for the required weight parameters and longer service life assigned, the structural mass was increased by 3 tons, basically by reinforcing the wing. The torsion box panels and spar webs and the panels' attachment to the spars and with each other were reinforced (riveted joints replaced bolted ones). The wing-fuselage joint was fundamentally changed. There are also differences in the aircraft's systems and equipment. In addition, new D-30KP-2 engines (second series) were installed on the aircraft to provide a takeoff thrust of 12 tons with an outside air temperature of up to plus 23 degrees (instead of 15 for the D-30KP engines).

The new aircraft—the Il-76TD—began cargo flights in 1982. Compared with the Il-76T, it has higher productivity (by 20 percent) because of an increase in the maximum takeoff mass up to 190 tons (instead of 170), an increase in maximum payload up to 48 tons (instead of 40), and an increase in the operational range (with the maximum load) by 1,200 kilometers.

Through introduction of the takeoff procedures worked out by the GosNII GA [State Civil Aviation Scientific Research Institute], the Il-76TD can be operated with the increased takeoff mass from the same runways as the Il-76T, economizing fuel on takeoff and increasing airfield capacity in the process. The improved fuel efficiency factor of the Il-76TD (0.215 kilogram as opposed to 0.268 kilogram per ton-kilometer) makes it possible for higher cargo volume to be carried with the same amount of fuel consumption.

The Tyumen Administration of Civil Aviation, the first to begin using this complex aircraft, has passed on the baton to other enterprises in the sector. At present, seven administrations are operating the Il-76 and both of its modified versions to cope with important problems in transporting national economic goods. During this period the sector has trained hundreds of highly skilled specialists to provide for reliable flight operation, maintenance, and high-quality repair.

In order to reduce the time and physical inputs to fly members of the Soviet Antarctic Expedition to their place of work and back and to transport cargo and equipment for the expedition, and because of the need to replace the Il-18D aircraft, the decision was made in 1985 to prepare Il-76TD aircraft for flights to Antarctica.

By the beginning of 1986, the operations and testing to make the first flight were completed. Removable equipment for passengers, the galley, sanitary facilities, and emergency rescue equipment were added to the aircraft to carry more than 90 persons. At the same time, work was carried out to prepare Molodezhnaya and Novolazarevskaya stations to accommodate the aircraft. Between 18 February and 4 March 1986, a proving flight was made by a TsUMVS [International Air Services Central Administration] crew, following the route Moscow-Larnaca, Cyprus- Djibouti-Maputo, Mozambique-Novolazarevskaya-Molodezhnaya and return. In the flight to Antarctica and back, 170 passengers and about 15 tons of urgent cargo were carried. This work, which received a high assessment from specialists, makes it possible to significantly shorten the time to take Soviet expeditions to stations on the ice continent and increase the productivity of seasonal operations.

Along with the increased fleet of aircraft, a base to repair them is being continuously developed. The first two aircraft of the Tyumen Administration were overhauled in 1981 at Repair Plant No 402. In order to reduce downtimes and the labor-intensiveness of operations, the OKB imeni S. V. Ilyushin, the GosNII GA, and Plant No 402 jointly worked out a system for inspection and restoration work. The first stage of the program to introduce a progressive system of repair according to technical condition was carried out successfully; next in turn was implementation of the second stage, including analysis of the technical condition of aircraft which have accrued the maximum time in service and have undergone inspection and restoration repair. During this period, the plant's collective acquired the experience necessary to repair both the aircraft and their components. Individual weak points in the structure were revealed, and updating is being carried out in accordance with bulletins. A special program to improve the quality of maintenance and the reliability of equipment being repaired has been introduced at the plant.

A new form of maintenance for the Il-76 and its modified versions, integrated with repair in stages (assigned by forms), was begun at Plant No 243 in 1986. The first aircraft which underwent repair in stages have already gone to operational enterprises.

Work is under way simultaneously in the civil aviation administrations, the GosNII GA, the NETs AUVD [Scientific Experimental Center for Civil Aviation Air Traffic Control Automation], the OKB imeni S. V. Ilyushin, the Tashkent Aviation Production Association imeni V. P. Chkalov, and other organizations to improve the airframe structures, assemblies and systems, and the flight control, navigation and avionics equipment of the aircraft. The service life of the aircraft and its components is being systematically increased. Improvement in the technical level has made it possible to reduce the mass of the structure, to extend the conditions for operation in accordance with airfield elevation, and to reduce fuel consumption.

Further extension of the conditions under which the Il-76, Il-76T and Il-76TD can operate is related to more widespread introduction of ICAO [International Civil Aviation Organization] Category II minimums at airports, as well as utilization of the method of cargo drops from low altitude in areas that are not easily accessible. Shipment of farm animals in special containers is being proposed as well.

There is no question that the Il-76, Il-76T, and Il-76TD will be playing an even more important role in development of the transportation system and opening up broad areas of our country. Proof of this is that more than a million tons of the most important cargoes have already been carried by the aircraft in 10 years of reliable and efficient operation in civil aviation.

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## RAIL SYSTEMS

### Rail Transport Problems Reviewed

18290053a Moscow PUT I PUTEVOYE  
KHOZYAYSTVO in Russian No 8 Aug 87 p 1

[Unattributed article: "The Times Dictate It"]

[Text] Railroad Workers Day, which we are celebrating this year, corresponds with important events. The country is preparing for the anniversary of Great October, and the workers on the steel mainlines are getting ready for the 150th anniversary of our domestic railroads. Thus, there seemingly is an occasion to report and to list labor victories in parade tones. Of course, victories do exist: During the All-Union Socialist Competition that took place in honor of the 70th anniversary of the revolution, the collectives of many track facility enterprises persistently achieved high production indicators. Nevertheless, it is now much more important for us to talk about not what has been achieved but about what has been omitted — about that which is delaying the forward movement which the times dictate.

During the present season, it is planned to carry out a larger amount of capital track work than before. This is understandable; you see, the pivotal task of coming years is to raise the capacity and reliability of the rights-of-way using accelerated rates. However, the improvement of the rails is still taking place too slowly. True, the schedule for installing the rail and sleeper grid and reinforced concrete sleepers is being observed. In return, we are falling behind what has been planned in all other types of work. We are using "windows" poorly. Moreover, we held 135 "windows" (every 17th one) too long during the five months. The reasons are the old ones: clumsy organization of the work, a low level of work and technological discipline, and breakdowns of equipment.

We are not managing to bring about a fundamental change in improving current track maintenance. Moreover, the point rating has even grown in comparison with last year. There are still many unsatisfactory kilometers on the railroads. The number of nonscheduled notices about limiting the speed of trains has also increased.

Life shows that the roots of a number of serious shortcomings are found in obsolete collective management methods and principles. The January and June party Central Committee plenums talked about this quite clearly. The task is to shift from administration to economic management more rapidly.

The Belorussian method has been incorporated almost everywhere now. However, all line enterprises did not get used to it painlessly since conditions were different. Although this same administrative approach has had an effect, practice testifies that this measure is objectively required. An even more complicated process is taking place — the mastery of the new management conditions. It is already evident that many are not prepared for this restructuring. One cannot blame only the line enterprises for this. An accurate picture of the new conditions still does not exist in the track services and in the higher management links.

Take such a question as economic independence. How should it be understood with respect to track enterprises? Is it possible to maintain that they are independent? If the answer is yes, then it is by stretching a point a great deal. If the answer is no, then to what degree? In return, a great responsibility lies on them. Everyone knows, however, that responsibility without independence is an illusion. Here is an example. Any intelligent leader takes care of his personnel first. If there are good strong personnel, there will be discipline, high qualifications, an accurate organization of work, and track reliability. The number one problem in attaching people to production is housing, more than 100,000 railway engineers are now in need of improved housing conditions. However, is the — for example — chief of a railway division independent in construction? No, no! Worse than that; according

to the testimony of many commanders, obstacles have recently become immeasurably greater than before. The initiatives, which had flared up like a spark, are being extinguished.

Furthermore, we have talked for a rather long time about thrift. It is necessary, they say, to inculcate and to foster it. These are appeals. But do we delve deeply into the mechanism of resource savings? As is known, an increase in the per-piece sum for current maintenance has been provided for on sections over which above-norm tonnage is carried. Whether 800 million tons or a billion are carried — the addition is the same. Is this correct? You see, an economic interest is required for thrift; however, not pay itself but the continuous percentage of its increase plays the role of the stimulus for this interest. Following common sense, therefore, income should be increased several-fold with an increase in above-norm tonnage and, consequently, in the amount of current maintenance work. This is also one of the economic preconditions for instilling thrift.

Fundamentally new tasks for improving the management of the economic structure were posed during the June CPSU Central Committee Plenum. They must be solved at all management levels. The track branch is also in need of serious changes. There will be many difficulties; restructuring is a complicated and long process, but not a reversible one. It is important that one not get lost in empty talk and discussions. One has to pay a good price for boldness, efficiency, socialist enterprise and initiative now. There are sufficient leaders, who are endowed with these qualities in the track facilities. It is necessary to support them in every way possible.

This Railroad Workers Day has coincided with the interest of the times. It is a holiday of holidays, and many new and interesting — but also difficult — deeds lie ahead.

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### Reform Measures Discussed

18290053b Moscow PUT I PUTEVOYE  
KHOZYAYSTVO in Russian No 10 Oct 87 p 1

[Unattributed article: "Radical Transformations"]

[Text] The program for a radical reform of the management of the economic system, which was adopted by the June CPSU Central Committee Plenum, absorbed the two years of restructuring experience and has outlined radical transformations that are connected with the shift to the new economic mechanism for the activity of enterprises. The plenum's decisions serve as a guide for action for each transport commander and each railroad worker before whom stands the main task that was

defined by the 27th party congress — the timely, complete and high quality satisfaction of the requirements of the national economy and the population for shipments.

In order to solve this very important task, it is necessary to restructure all rail transport work radically by accelerating scientific and technical progress and by making highly effective use of production potentials.

Under the conditions of complete cost accounting and self-financing, profit is becoming the decisive factor in the economic and social development of enterprises. This means that one must energetically achieve a reduction in expenses and every conceivable increase in income within all spheres of activity. Enterprise collectives themselves will solve the main social problems through the social development and material incentive funds.

In one and a half years, our labor productivity has grown by 14.3 percent when the target for the entire five-year period was 12 percent. A total of 440 million rubles of profit has been received above the plan. Almost 2.5 million railroad workers have gained increases in their pay, which averages almost 250 rubles a month for workers engaged in transportation.

Transport's success would have been extremely higher if there had been no interruption tolerated last winter. During the first quarter of this year, 45.5 million tons were not loaded. Despite the subsequent stabilization of the operating situation during the first half of the year, we did not manage to make up for what had been missed; a debt of 38.8 million tons remains. The primary duty of railroad workers now consists of unconditionally fulfilling the 1987 plan. This is a very important precondition for a confident shift to complete cost accounting and self-financing in 1988. Guided by the results of the introduction of the Belorussian method, it is necessary to achieve another 8.6 percent growth in labor productivity before the end of the current year.

Speaking at a meeting of the Ministry of Railways Collegium, Minister N. S. Konarev sharply criticized the situation that has taken shape in track facilities. Total expenditures for repairing track are reaching 1.5 billion rubles a year. The condition of the track, however, is not being improved. The number of notices about limiting the speed of trains is growing, especially on the South-eastern, October, Volga, and Dnepr railroads. Approximately 16 percent of all freight train delays and 42 percent of passenger train delays occur because of deficiencies in track facilities. Especially large disruptions were tolerated during the winter period. The Lines Main Administration and the railroads are not paying the required attention to improving capital repair technology and the current maintenance of the route. The making of a "window" for one hour is practically not growing and has averaged 326 linear meters on the network for many years. At the same time, such progressive enterprises as — for example — the Kuybyshev

Railroad's OPMS [Experimental Track Machine Station]-61 are laying up to 1,000 linear meters an hour. Unfortunately, the experience of the foremost people is being poorly disseminated. Highly productive straightening machines are being used extremely unsatisfactorily. Incidentally, the dispatching staff of the Railway Traffic Main Administration and the dispatchers on the railroads are guilty of this to a great extent.

The minister posed the following tasks, which flow from the decisions of the June CPSU Central Committee Plenum, to railroad workers, including the railway engineers:

— Sharply expand the borders of railroad, division and enterprise independence; increase their responsibility for final work results; establish a direct dependence of income on production efficiency;

— Concentrate centralized management on the main questions; eliminate the petty guardianship of lower links;

— Restructure the planning, price formation and material technical supply systems and the management of scientific and technical progress and social processes;

— Establish new and progressive organizational structures; insure the inclusion of science into production;

Expand self-management; fundamentally change the administrative style and work methods of the management staff; improve the activity of economic subunits.

The base for restructuring is being laid today. The accurate development of the economic mechanism so that rail transport will operate steadily and effectively under the new conditions, depends on each one of us.

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#### Railroad Statistics

18290053c *PUT I PUTEVOYE KHOZYAYSTVO* in Russian No 9 Sep 87 p 1

[Unattributed article: "The USSR Is a Great Railroad Power"]

[Text] The operating length of USSR railroads is 145,400 kilometers; 50,500 kilometers of them have been electrified.

In 1986, rail transport crossed the four billion frontier for the first time — 4.06 billion tons of freight were transported.

Freight turnover in rail transport is 3.8345 trillion ton-kilometers. It has grown almost 50-fold during the years of Soviet power.

Last year, Soviet subways carried 4.6 billion passengers.

The average weight of a freight train is equal to 3,094 tons.

In 1986, labor productivity in rail transport grew by 7.6 percent. This exceeded the planned target 3.6-fold.

Approximately 2.5 million people work on the steel mainlines.

The length of continuous welded railway track is 57,000 kilometers.

The right-of-way is protected against snow and sand drifts by tree plantings along almost 80,000 kilometers.

The average linear weight of the rail on the main rights-of-way is equal to 60.7 kilograms per meter.

R65 and R75 type rails are on 141,500 kilometers. A total of 46 percent of them have been hardened by heat treatment.

Approximately 50,000 kilometers of track are fixed by all types of repairs annually.

Track industrial enterprises produced more than 30 million cubic meters of crushed stone during the year and impregnated more than 3.5 million cubic meters of sleepers.

Every fourth sleeper on the roadbed is made of reinforced concrete.

Straightening and lining work is being performed by machines on a length of more than 100,000 kilometers.

More than 14 million kilometers of rails, 5.5 million welded joints and 3 million switches are annually inspected using non-destructive testing equipment.

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#### Expansion of Superexpress Train Service

18290053d *Moscow SOVETSKAYA ROSSIYA* in Russian 15 Nov 87 p 6

[Untitled article by V. Orlov and V. Romanchin]

[Excerpt] The day before while traveling on a high-speed superexpress ER-200, N. S. Konarev, USSR minister of railways, answered a question about how the country's high-speed mainlines will be further expanded by saying

that they plan to acquire another two ER-200 superexpress trains during the next two years. Thus, they will continue to build special high-speed sections and lines. One of them will be built from Moscow to the south and the second one in the direction of Brest. Incidentally, it is not only the ER-200 express trains that will help to increase speed on the country's railroads. The railroad workers recently purchased Czechoslovak produced locomotives that also have a speed of almost 200 kilometers per hour.

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### Rail Transport Progress, Problems, Prospects Reviewed

18290053e Moscow ELEKTRICHESKAYA I TEPOVOZNAYA TYAGA in Russian No 10 Oct 87 pp 2-4

[Interview with V. P. Kalinichev, USSR deputy minister of railways, by B. N. Zimting, ELEKTRICHESKAYA I TEPOVOZNAYA TYAGA correspondent; date and place of interview not given, first three paragraphs are ELEKTRICHESKAYA I TEPOVOZNAYA TYAGA introduction]

[Excerpts] This anniversary of Great October coincides with the 150th anniversary of the construction of the first general-use railroad — Peterburg-Tsarskoye Selo — which marked the start of rail transport development in our country.

Speaking in December 1921 at the Ninth All-Russian Congress of Soviets, V. I. Lenin called transport "one of the most important bases of our entire economic structure." This definition by Lenin is especially topical today when crucial tasks regarding the timely, qualitative and complete satisfaction of the requirements of the country's national economy and population for shipments and for increased economic effectiveness face the steel mainline workers.

B. N. Zimting, our special correspondent, met with V. P. Kalinichev, USSR deputy minister of railways, and asked him to answer a number of questions.

[Question] Quite a few glorious and heroic pages have been written in the history of the country's railroad development. That is why, Vasiliy Petrovich, it is worthwhile to recall the main stages in the development of our motherland's steel rights-of-way first.

[Answer] Transport was considerably developed after the end of the war [World War II]. Radical changes occurred in railroad equipment. Powerful electric and diesel locomotives arrived to replace steam ones. The electric locomotives began to carry out more than 60 percent of the shipping volume and pull trains on a 50,000-kilometer loop. The power of diesel locomotives in one section was brought to 3,000-4,000 horsepower.

The widespread introduction of powerful locomotives permitted speed to be increased considerably and the weight of trains to be increased; it reached 3,100 tons on the average. The driving of freight trains with a weight of 6,000, 8,000, 10,000, and more tons was mastered.

[Question] Our country's railroads achieved enormous technical progress during a comparatively short historical timeframe. Tell us, please, in more detail about the development of the steel mainlines during the 70 years of Soviet power and about them today.

[Answer] Enormous work in constructing railroads and in developing transport has been carried out during the years of Soviet power. Having inherited a technically poorly developed transport system from tsarist Russia, the young worker and peasant state transformed it into the most powerful railroad system in the world.

The operating length of the network was increased from 70,300 kilometers in 1917 to 145,400 kilometers in 1986. Freight turnover has correspondingly grown from 63 billion to 3.832 trillion ton-kilometers and passenger traffic — from 22 billion to 390 billion passenger-kilometers.

Production innovators deserve enormous credit for this. Among them I would like to mention the following train engineers in particular: P. F. Krivonos, N. A. Lunin, V. G. Blazhenov, Ye. M. Chukhnyuk, S. Ye. Yatskov, and V. V. Shemakhov — Heroes of Socialist Labor; and, of course, V. F. Sokolov, who has been conferred this award twice. Their work baton is now in the reliable hands of young engineers.

With a total network length that forms only 12 percent of the length of all railroads in the world, USSR steel mainlines carry 52 percent of the world's railroad freight turnover and 24 percent of passenger turnover. The average density level of freight traffic, which has been achieved, significantly exceeds the indicators for the intensity of rail transport operations in other countries in the world.

In the USSR's unified transport system, approximately two-thirds of internal freight turnover and almost half of intercity and suburban passenger traffic fall to the share of the railroads. The proportion of the railroads in overall transport operations is decreasing somewhat in connection with the intensive development of pipeline, motor and air transport. In the period being reviewed, however, the steel mainlines will maintain their leading role in the country's transport system.

This priority is determined by the decisive advantages of rail transport: high carrying capacity, comparatively low costs, low energy-intensiveness, maximum shipping dependability, practical independence from climate conditions, and minimum impact on the surrounding environment.

USSR railroads are not only noted for their high freight traffic density but also for their very high intensity in using technical assets and for the production of locomotives and railroad cars. The labor productivity of Soviet railroad workers is one of the highest in the world, and shipping costs are approximately three kopecks per 10 ton-kilometers. All of this confirms the long-term prospects for transport in future years.

[Question] It is known that the beginning of this year did not start very successfully for transport. It would be interesting to know how things are going in the branch now?

[Answer] Having joined in the socialist competition to greet the 70th anniversary of Great October in a fitting manner, many progressive collectives came forward with an initiative to meet the targets of the first two years of the five-year plan by the date of the glorious jubilee based on the most important indicators. In 1987, the railroad workers must bring the shipping of freight to 4.09 billion tons — and considering socialist obligations — 4.115 billion tons.

The severe winter of 1986-1987 made its own adjustments to transport plans. Not all of the railroad workers and consignees were prepared to work under the extreme conditions. As a result, 45 million tons of cargo were not loaded during the first quarter, and the branch did not receive almost 150 million rubles of profit.

We are talking about this today not for the purpose of shifting responsibility for our blunders to nature but for the purpose of drawing correct conclusions and preventing similar situations in the future.

Beginning in April, the shortfall in the shipping plan, which was allowed during the first quarter, was gradually made up. The level of operational work and the use of technical assets have been raised and this has permitted the main economic indicators to be improved and the target for increasing labor productivity to be exceeded.

From April to July inclusive, 7.1 million tons of the debt have been dispatched. Unfortunately, the satisfaction of the debt is not taking place at the rate that we would like. A total of 11 railroads have failed to fulfill the plan; of them, the Kuybyshev, Far Eastern, Baltic, Transcaucasian, Odessa, and others have done so on the largest scale.

Targets for statistical loading are not being met on many mainlines; at the present time, it is 130 kilograms below the plan. As calculations show, this has led to losses of 5.5 million tons of freight in shipments. The average weight of a train has reached 3,092 tons; this is 47 tons lower than the planned target.

Basically through the fault of the traffic, lines and locomotive services, the section speed for freight trains has been reduced by 0.5 kilometers per hour and is 31.8 kilometers per hour. This has also led to a reduction in shipping volumes.

This summer revealed many shortcomings in servicing passengers. The railroads transported 2.113 billion persons during the first seven months. Passenger traffic is unpredictable, and the question has put the appropriate main administrations into a very difficult situation. When compared to the same period of last year, the volume of passenger traffic increased by 10 million people; seven million of them — on long distance service.

The travel schedule of passenger trains is being implemented significantly worse than last year. The total time of their dispatch and travel delays has reached 142,600 train-hours; this has caused unproductive expenditures of almost 4.5 million rubles.

The technical condition of the locomotive pool has also worsened. The Lvov, Odessa, Azerbaijan, Gorkiy, Volga, and West Kazakhstan railroads are not adhering to the established norm for the percentage of locomotives needing repairs. The number of unplanned electric locomotive repairs grew by 36 percent; and that of diesel locomotives — by 16 percent.

The shortcomings in organizing the fulfillment of the train movement schedule have had a considerable impact on the use of the working time of locomotive brigades. During the seven months, the number of trains with violations of working conditions on the network increased 1.4-fold as opposed to the same period of last year. Their increase occurred on 25 railroads — primarily on the North Caucasus, Volga, Southeastern, Southern, and Transcaucasian.

An extraordinary situation took shape on a number of roads in connection with insuring traffic safety, especially that of passenger trains. Large errors, irresponsibility and formalism in organizing the struggle against wrecks and accidents led to large defeats on the Southeastern, Gorkiy, Volga, Azerbaijan, Transcaucasian, Kemerovo, Tselina, Kuybyshev, and a number of other railroads. The wreck at the station of Kamenskaya was discussed in particular during a session of the C.C. Central Committee Politburo.

As you see, the situation on the rail network is very strained and there is no occasion for complacency and composure — and one is not foreseen. However, there is also no justification for panic. Vladimir Ilich Lenin said that the best way to celebrate the jubilee is to concentrate attention on unsolved problems. The basic mass of Soviet railroad workers represents a strong, competent

and able-bodied collective which is capable of overcoming all difficulties and fulfilling the tasks, which have been assigned by the 27th CPSU Congress, in a fitting manner.

[Question] Incidentally, concerning the tasks — would you please tell us in more detail what transport workers must do during the 12th Five-Year Plan and during the period out to the year 2000?

[Answer] The strategic tasks of rail transport during the period out to the year 2000 are: insuring the timely, complete and qualitative satisfaction of the needs of the national economy and the population for shipments, increasing the economic efficiency of the branch, significantly raising the living standards of railroad workers, and solving social problems.

The branch must transport 4.3 billion tons of freight and 402 billion passengers by 1990. This means that it is necessary to ship 12 million tons of the most varied cargo daily. A total of 200,000 railroad cars will be required to accommodate them.

In order to achieve these frontiers, we plan to increase the through-put and carrying capacity of lines and the handling capacities of classification, freight and passenger stations by reconstructing and reequipping them and to accelerate the further expansion and reequipping of locomotive and railcar depots and plants for the repair of rolling stock and the production of spare parts and switches.

Increasing the travel speed of trains and also their weight by increasing the length of consists, making better use of railcar capacities and acquiring new eight-axle railcars with a rated load capacity of 125-130 tons can be related to the most fundamental aspects of technical development. Large reserves lie in the use of automatic systems for controlling locomotives during the connection of several trains and the bringing of their weight up to 12,000-18,000 tons.

The speed of freight trains will be increased thanks to the complete shift of the rolling stock to roller bearings, the introduction of new automatic block systems, the modernization of catenary system equipment, and the increase in the power of locomotives.

Transport workers will receive locomotives with a truly Herculean power: VL85 and VL15 electric locomotives with a power rating of 10,000 and 9,000 kilowatt hours, respectively, and 2TE121 and 2TE136 diesel locomotives with a power rating of 4,000 and 6,000 horsepower in one section.

The electrification of the railroads remains a main avenue of scientific and technical progress. At the present time, the length of electrified lines is 30 percent of the network's length. An effective 2X25 kilovolt alternating current power supply system is being successfully incorporated.

It is planned to provide another 8,000 kilometers during the 12th Five-Year Plan. Power will be amplified, the dependability of the power supply systems will be raised, information control complexes based on microcomputers will be introduced, and 7,500 kilometers of electrified lines and power supply equipment at 20 railroad hubs will be shifted to telecontrol.

In order to satisfy the growing requirements in passenger traffic, an increase in the length of consists both in suburban service (to 10-12 cars — and to 20 cars in the future) and in long distance service (to 20-24 — and to 32 cars in the future) is being provided for. The addition of a single railroad car to each train increases passenger traffic by 20 million people a year.

The new management conditions, to which all railroads, divisions, enterprises, and organizations of the Ministry of Railways are being transferred this year, have also been called upon to play an important role in improving the work of the branch. These conditions provide for the expansion of independence, the restructuring of planning based on increasing the role of five-year plans, and the strengthening of the influence of intraproduction cost accounting on improving the work activity of collectives and all workers.

Transport enterprises and organizations will shift to complete cost accounting and self-financing in 1988. The blending of such forms of progressive labor organization as the Belorussian method and the new management conditions will permit a high level of efficiency to be achieved in shipping work. More than 200,000 people will be released by 1990 for the needs of the national economy.

[Question] You mentioned that the successful solution of social programs is one of the main tasks facing transport....

[Answer] It is known that improving work and rest conditions and showing a concern for people will contribute to further increasing labor productivity and to making workers more active in fulfilling strenuous plans.

Much is being done in the branch to improve the social, cultural and domestic conditions of the railroad workers. During the present year, the pay of workers employed in transport grew from 231.5 to 247.5 rubles, or by 6.9 percent, during the seven months.

In order to attach personnel to places with difficult natural and climatic conditions and to attract qualified personnel to sparsely populated — but important from a national economic regard — places, rayon coefficients for income and appropriate allowances have been established for railroad workers.

Work is being performed to improve housing conditions. During the last five-year plan, 7.3 million square meters of housing were constructed and commissioned in transport. During the 12th Five-Year Plan an entire program of measures will be implemented to improve the social development of the branch. A decision has been made to commission 50,000 apartments a year for railroad workers.

The branch has a complete network of medical institutions at its disposal. Here, 40,000 doctors and more than 102,000 mid-level medical personnel work. A total of 686 hospitals with 118,000 beds and 12,280 polyclinics are operating on the network. There are more than 100 sanatorium dispensaries, which are equipped with the necessary treatment and diagnostic equipment and physical therapy sets, and 260 rest camps and holiday hotels.

It is planned to construct children's institutions with 42,000 places, general educational schools with 42,000 seats, and hospitals with 8,000 beds in the next few years. A total of 24 sanatorium dispensaries, 10 holiday hotels, 20 club establishments, 24 sport complexes, and 11 pioneer camps will be erected.

[Question] And the last question. How are Soviet railroad workers planning to celebrate the 150th anniversary of the steel mainlines, and what measures are being planned in honor of this holiday?

[Answer] A press conference for Soviet and foreign journalists, which was devoted to the anniversary event, was held at the beginning of the year in the press center of the USSR Ministry of Foreign Affairs.

Memorial calendars have been published and a set of badges and a series of five postage stamps have been produced. The Izobrazitelnoye Iskusstvo Publishing House has prepared a collection of 16 post-cards entitled "Historical and Revolutionary Relics — Steam Engines Linked With the Name of V. I. Lenin and the Heroic Pages of USSR History."

A scientific technical conference, which is devoted to the 150th anniversary of our railroads and in which the directors of the Ministry of Railways, important scientists, inventors, production innovators, and foreign guests will participate, is being organized at the Exhibition of USSR National Economic Achievements.

Thematic evenings, film festivals, and meetings with production innovators are being held, and stands telling about the history and present-day status of transport are on display in all railroads, enterprises and organizations of the Ministry of Railways and the Ministry of Transport Construction.

The jubilee will be celebrated in a gala manner in the motherland of the first railroad. The high-speed ER200 electric train, on which, N. S. Konarev — the USSR minister of railways — will conduct a press conference for guests of the gala event, journalists and foreign guests, will travel from Moscow to Leningrad on 13 November.

A full-scale model of the first train on the Tsarskoye Selo Railroad has been set up in Leningrad's Vitebsk terminal. A train, formed from railroad cars of the old-type construction and a steam engine, will travel on the Leningrad-Pavlovsk section. Conductors in the uniform of those years will work on it. An exhibition of modern railroad equipment has been organized at the Finland Station. The holiday will end with a large concert in the October film concern hall.

In conclusion, I would like to congratulate all the readers of your magazine and all railroad workers on the two great events — the 70th anniversary of the October Revolution and the 150th anniversary of our railroads.

[Question] In the name of our readers, I thank you for your congratulations and the interesting discussion.

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#### Report on Freight Car Idleness

18290027a Moscow EKONOMICHESKAYA GAZETA  
in Russian No 45, Oct 87 p 4

[Unattributed report: "Railcar Idle Time on Sidings"]

[Text] Railcar idle time on sidings for January-September 1987 was an average of 7.54 hours versus a norm of 6.93 hours, that is, over by 8.8 percent. This is higher than last year's level. The railcar inventory was artificially reduced by 295,000 cars due to the untimely execution of loading and unloading operations.

Especially great losses occurred at the enterprises of USSR Minpribor [Ministry of Instrument Making, Automation Equipment and Control Systems], where car idle time exceeded the norm by 66 percent, Tsentrosoyuz [USSR Central Union of Consumer Societies] (62.2), USSR Mintorg [Ministry of Trade] (43.6), USSR Minnefteprom [Ministry of the Petroleum Industry] (43.1), USSR Minyugstroy [Ministry of Construction in the South] (43), USSR Minlegprom [Ministry of Light

Industry] (36.1), USSR Gosagroprom [State Agro-Industrial Committee] (33), USSR Minlegpishchemash [Ministry of Machine Building for Light and Food Industry and Household Appliances] (32.3), USSR Minelektrotekhprom [Ministry of the Electrical Equipment Industry] (30.1), USSR Minlesbumprom [Ministry of the Timber, Pulp and Paper, and Wood Processing Industry] (29.9), USSR Minkhimprom [Ministry of the Chemical Industry] (29) and USSR Minkhimmash [Ministry of Chemical and Petroleum Machine Building] (28 percent).

It should be noted on the positive side that railcar idle time at the enterprises of USSR Minugleprom [Ministry of the Coal Industry] was 2.9 percent below the norm, and 4.7 percent below at RSFSR Minavtotrans [Ministry of Motor Transport].

An analysis of operations in January-September 1987 in a territorial breakdown shows that railcar idle time on enterprise sidings in a number of union republics was lower than the norm. This relates to the Belorussian SSR (7 percent), the Estonian SSR (2.5 percent) and the Moldavian SSR (0.8 percent).

At the same time, railcar idle time on enterprise sidings of the Tajik SSR was 76.1 percent over the norm, along with 24.9 in the Armenian SSR, 22.5 in the Uzbek SSR, 13.8 in the Georgian SSR, 13.2 in the Turkmen SSR, 11.9 in the Kirghiz SSR, 11.3 in the Ukrainian SSR and 9.8 percent in the Azerbaijan SSR.

Railcar idle time in the RSFSR was an average of 8.7 percent over the norm, although on enterprise sidings feeding into the Baykal-Amur Mainline the norm was exceeded by 33.6 percent, 25.2 on the East Siberian, 22.6 on the Volga, 22.1 on the Moscow and 19.7 percent on the North Caucasus.

It should be noted herein that railcar idle time at enterprises on the South Urals Railroad was 2.3 percent below the norm, and it was 0.2 percent below the norm on the Kemerovo Railroad.

### Personnel Changes Reported

#### A.A. Zaytsev

*Moscow GUDOK in Russian 9 Sep 87 p 2*

Zaytsev Anatoliy Aleksandrovich appointed chief of the October Railroad with release from the duties of deputy chief and railroad traffic-safety inspector of that railroad.

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Zaytsev Anatoliy Aleksandrovich, born 1940, Russian, CPSU member since 1969, railroad engineer and electrical mechanic. Worked in railroad transport since 1958. Worked his way up from fireman of a steam locomotive to chief of the locomotive depot. On party

work from 1975 to 1984. Elected second and first secretary of the Kandalaksha CPSU Gorkom. Next A.A. Zaytsev was chief of the Murmansk Division of the October Railroad. Deputy chief and railroad traffic-safety inspector of that railroad since 1986.

#### I.I. Khaba and Others

*Moscow GUDOK in Russian 20 Sep 87 p 2*

Khaba Igor Ivanovich—chief of the Railroad Cars Main Administration [MA] of MPS with release from the duties of deputy chief of that same administration.

Born in 1939, Russian, CPSU member, railways engineer and mechanic. His labor activity in railroad transportation began in 1957 as a railcar inspector. After completing the Omsk Institute of Railroad Transportation Engineers, he worked as a team leader, foreman, chief engineer, deputy chief and chief of a railcar depot and deputy chief and chief of the railcar facilities of the Southern Railroad. From 1985 to 1987, department chief designer and department chief of the planning and design bureau of the MPS Railroad Cars MA. Since March 1987, deputy chief of the railcars MA.

Appointed by order of the Ministry of Transport Construction:

Morits Ernst Yakovlevich—chief of Glavtranselektromontazh [Transport Electrical Equipment Installation MA];

Volkovskiy Stanislav Nikolayevich—first deputy chief of Glavbamstroy [BAM Construction MA];

Maleyev Aleksandr Ivanovich—deputy chief of Glavzheldorstroy [Railroad Construction MA] for the Urals and Siberia;

Semykin Yuriy Tarasovich—deputy chief—chief engineer of Glavtranselektromontazh;

Leytland Vladimir Grigoryevich—director of SoyuzdorNII [State All-Union Scientific Research Institute of Roads and Highways];

Dyachenko Viktor Nikolayevich—chief of the construction administration of Bamstroyput [BAM Track Construction];

Anikeyev Viktor Alekseyevich—manager of Bamstroykomplekt [BAM Construction and Outfitting] Trust;

Karapetov Sergey Mikhaylovich—manager of Sibstroymekhanizatsiya [Siberian Construction Mechanization] Trust;

Gorshechnikov Boris Vasilyevich—manager of Urengoytransstroy [Urengoy Transport Construction] Trust;

Kubasov Nikolay Ivanovich—manager of Orgtranstekhstroy [Organization of Transport and Technical Construction] Trust;

Naborskiy Vasiliy Pavlovich—manager of Aktyubinsk-transstroy [Aktyubinsk Transport Construction] Trust;

Blinov Vladimir Dmitriyevich—manager of Nadymdstroy [Nadym Roads Construction] Trust;

Kokota Ivan Ivanovich—manager of Mostostroyindustriya [Bridge Construction Industry] Trust.

#### Additional Changes

*Moscow GUDOK in Russian 30 Sep 87 p 2*

Appointed by order of the Ministry of Railways:

Ilin Vladimir Nikolayevich—first deputy chief—chief engineer of the Electrification and Power Resources MA of MPS.

Kryuchkov Oleg Mitrofanovich—first deputy chief of the Donetsk Railroad and release from his duties as chief of the Debaltsevo Division of that railroad.

Delov Vladimir Borisovich—deputy chief of the Donetsk Railroad with release from the duties of chief of the traffic service of that railroad.

Chepak Vladimir Grigoryevich—deputy chief of the Southwestern Railroad for personnel and social issues.

Ermetov Normat—chief of the traffic service and deputy chief of the Central Asian Railroad with release from the duties of chief of the Karakalpak Division of that railroad.

Abramashvili Deni Sergeyevich—chief of the Tbilisi Division of the Transcaucasus Railroad.

Zakariadze Valerian Valerianovich—chief of the Likhovka Division of the Southwestern Railroad.

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Dmitriyevskiy Gennadiy Vladimirovich—released from the duties of first deputy chief and chief engineer of the Electrification and Power Resources MA in connection with his retirement. Gratitude is offered to him for many years of work in rail transport.

Kisin Anatoliy Leonidovich—released from the duties of deputy chief of the Sverdlovsk Railroad by personal request in connection with a transfer to other work.

Mozgovoy Ivan Ivanovich—released from the duties of deputy chief of the Southwestern Railroad for personnel and social issues in connection with his retirement. Gratitude is offered to him for many years of work in rail transport.

Adylov Aziz—released from the duties of chief of the traffic service and deputy chief of the Central Asian Railroad in connection with his retirement. Gratitude is offered to him for many years of work in rail transport.

Karumidze Nugzar Iosifovich—released from the duties of chief of the Tbilisi Division of the Transcaucasus Railroad in connection with a transfer to other work.

#### More Ministry Changes

*Moscow GUDOK in Russian 28 Oct 87 p 2*

Appointed by order of the Ministry of Railways:

Yarylovels Viktor Vasilyevich—first deputy chief of the Dnieper Railroad with his release from the duties of deputy chief of the Donetsk Railroad.

Filatkin Yuriy Nikolayevich—first deputy chief of the Moldavian Railroad with his release from the duties of chief of the traffic service and deputy chief of that railroad.

Zolotarev Boris Dmitriyevich—deputy chief of the Southeastern Railroad with his release from the duties of chief of the locomotive service of that railroad.

Rusakov Vladimir Ignatyevich—chief of the traffic service and deputy chief of the West Kazakhstan Railroad.

Serik Konstantin Stepanovich—chief of the traffic service and deputy chief of the Moldavian Railroad.

Lukhanin Nikolay Ivanovich—chief of the Debaltsevo Division of the Donetsk Railroad.

Babayev Salman Magomedrasulovich—chief of the Urgal Division of the Baykal-Amur Railroad.

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Kalinichev Vasiliy Petrovich—released from the duties of deputy minister of railways for personnel in connection with his transfer to other work.

Kirillov Vasiliy Grigoryevich—released from his duties as first deputy chief of the Dnieper Railroad in connection with his retirement. Gratitude is offered to him for many years of work in rail transport.

Zelinskiy Vitaliy Mikhaylovich—released from his duties as first deputy chief of the Moldavian Railroad in connection with his retirement. Gratitude is offered to him for many years of work in rail transport.

Chevrizov Anatoliy Afanasyevich—released from his duties as chief of the Urgal Division of the Baykal-Amur Railroad by personal request for health reasons. Gratitude is offered to him for many years of work in rail transport.

**Improving Commercial Operations**  
*Moscow GUDOK in Russian 28 Oct 87 p 2*

[Text] With the conversion of railroad transport to full economic accountability [khozrashchet] and self-financing, the role and significance of commercial activity on the railroads and in the Ministry of Railways will increase considerably. Under the new management conditions, commercial operations should be oriented

toward creating the essential conditions for achieving good results in the operational, economic and financial activity of enterprises, railroads, railroad divisions and the sector overall.

The Ministry of Railways, in imparting great significance to improving commercial operations in rail transport and raising its economic efficiency, has planned a whole set of measures for its radical improvement.

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END

**END OF  
FICHE**

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30 March  
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